TORREYA

A Bi-Monthly Journal of Botanical Notes and News

John Torrey, 1796-1873

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

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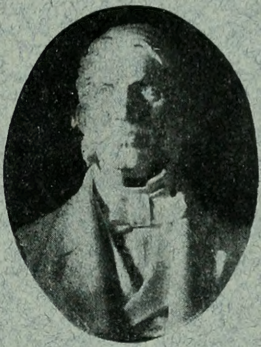

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TORREYA

Vol. 24 No. 1

January-February, 1924

SPRING FLOWERS IN THE WINTER

George T. Hastings

Next spring's flowers are all in the woods this winter. To find them one must hunt below the soil, or beneath the scales covering the buds of the flowering shrubs and trees. When it becomes too cold for growth to continue there are three ways in which plants may spend the winter. All annual plants die, leaving the host of seeds to produce the next season's plants; shrubs and trees become dormant, the tender growing points wrapped around with layers of dry scales coated with waterproof varnish or wax; with other plants the parts above ground may die, an underground stem remaining. In none of these ways is the plant protected against cold or freezing. Even when under ground the stems and buds are usually so near the surface that they with the soil around them will be solidly frozen. The protection given is chiefly against drying; the seeds with the nearly waterproof seed coat, the bud with the varnished scales, the underground parts packed around with soil beneath a carpet of dead leaves. The bud, whether on the tree or below ground, is more than a growing point with the inherent power of developing stem, leaves and flowers, for the early spring flowers at least, it contains in miniature all the flowers and leaves of next season, ready to expand when wakened by the warmth of April or May. In the winter, or before growth begins in the spring, we may hunt the early flowers by digging down for a few inches in the soil of the woods. After finding the bulbs or rootstocks with their pale buds it is fascinating to open one of the latter, carefully removing the protecting scales, to find the tiny perfectly formed leaves and flowers.

One of the most easily found of these plants is the hepatica (*Hepatica triloba*, or *H. acutiloba*), easily recognized by the old leaves which remain. Usually within an inch or less of the

surface are the pointed buds about half an inch long, white with a reddish or violet tip, at the top of short, erect rootstocks. Under the second or third scale is the first flower bud, densely covered with silky hairs on the peduncle and the three bracts, the sepals just showing at the tip. The next scale, thinner and almost transparent, covers the second bud, slightly smaller than the first. Under other scales come the succeeding flowers and at the center a tiny, pointed mass of relatively long hairs indicates the closely folded, three-lobed leaves.

Just above the ground in the woods one may find slender green leaves from a quarter to a half inch long. These grow from a solid brown corm about quarter of an inch across, buried an inch or two below the surface. From the corm grow several smaller leaves, the narrow blades pale yellow and folded back on the petiole. Usually one or two flower shoots may also be found with several flower buds of assorted sizes between two tiny bracts. Each is covered by two sepals, the tiny petals within showing no hint of the pink lines that make the spring beauty so attractive. As last year's leaves had withered shortly after the seeds matured in the spring these young flowers must have been formed months ago.

Well buried, two to six inches deep, one may find the horizontal rootstocks of the False Solomon's Seal or Wild Spikenard, (*Smilacina racemosa*); these run for a foot or more with occasional branches. An inch or more apart in the rootstock are the scars of flowering stems, often a dozen or more showing that a leafy branch has been sent up into the air each spring for that number of years. At the end of each branch of the rootstock conical buds turn up, the smaller of these contain only leaves, the larger contain leaves and flowers. After removing three or four white scales, the inner ones covering the entire bud, one finds ten or twelve pale yellow leaves each wrapped around the ones nearer the tip of the stem. Inside the last of these is the white flower cluster, a tiny stalk an eighth of an inch long, closely covered with flowers. The latter under the hand lens are seen to be complete with a ring of six stamens and a perianth that can be found only when a flower is dissected out of the cluster and examined from the side. One cannot help but marvel at the beautiful way in which the parts are packed together and prepared so far in advance of the time of opening. This is not all, though, for below

the bud on the rootstock is a much smaller bud, that now shows only a pair of protecting scales about a solid mass of tissue. This bud will carry the underground stem on an inch or two next year and develop the bud for year after next.

In situations similar to that where the False Solomon's Seal was found one may find an irregular mass of dark brown rootstocks with a yellowish white bud pointing up at the end of each of the many branches, the winter condition of the wild geranium (*Geranium maculatum*). Here the scales that protect the bud are two-lobed. The outer one may show three or five tiny brown points in the notch, the next a rudimentary five-lobed leaf. These first leaves were not meant to develop, the petiole united with the stipules, being used only for protection. Under three or four of these scales are the leaves, the five or seven divisions folded on each other and bent forward to touch the stipules folded around the next leaf, which shows pale orange red through their waxy white sides. Within the last pair of stipules is the flower cluster. The leaflets on the flower stalk and a series of delicate bracts surround the tiny buds. The tips of the sepals, mere points when the flower opens, are now like gnomes' caps covering the petals and stamens.

In similar ways the anemones, buttercups, early meadow rue, Solomon's seal, dog-tooth violet and other spring flowers may be found at any time the ground can be dug from September on. It should add to the interest of winter hikes to know that these flowers are already waiting below ground for the coming of spring; it will certainly be a fascinating experience to open one of these buds and examine the leaves and flowers with a pocket lens.

Explanation of plate I

FIG. 1. Hepatica, (*Hepatica acutiloba*).

Plant, × 2; bud opened to show flower buds and leaf cluster at center, × 2; section of flower bud, × 5.

FIG. 2. Wild Geranium, (*Geranium maculatum*).

Rootstock, × 1; terminal bud with outer scales removed, same with leaves removed to show flower bud, one of outer scales with leaf rudiment, leaf with stipules spread out, all × 4; flower bud in section, × 25.

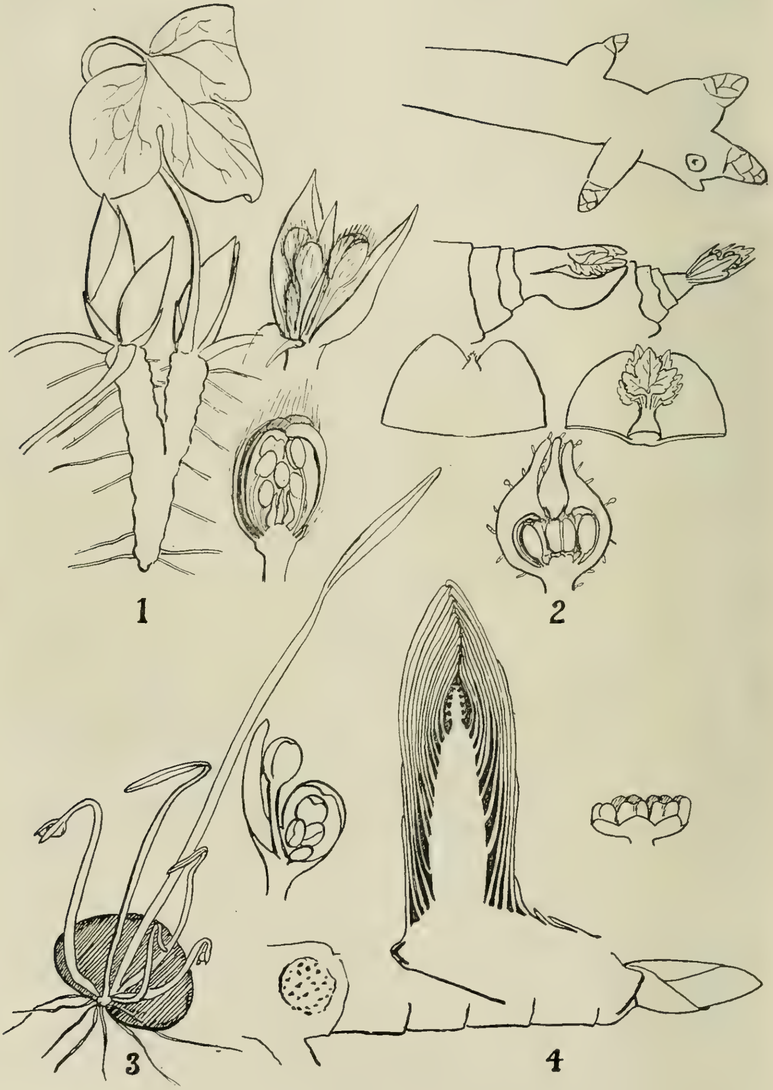
FIG. 3. Spring Beauty, (*Claytonia virginica*).

Plant, × 2; flower cluster, × 8.

FIG. 4. False Solomon's Seal, (*Smilacina racemosa*).

Rootstocks, × 1; bud in section, × 3; flower from bud, × 25.

NEW YORK CITY.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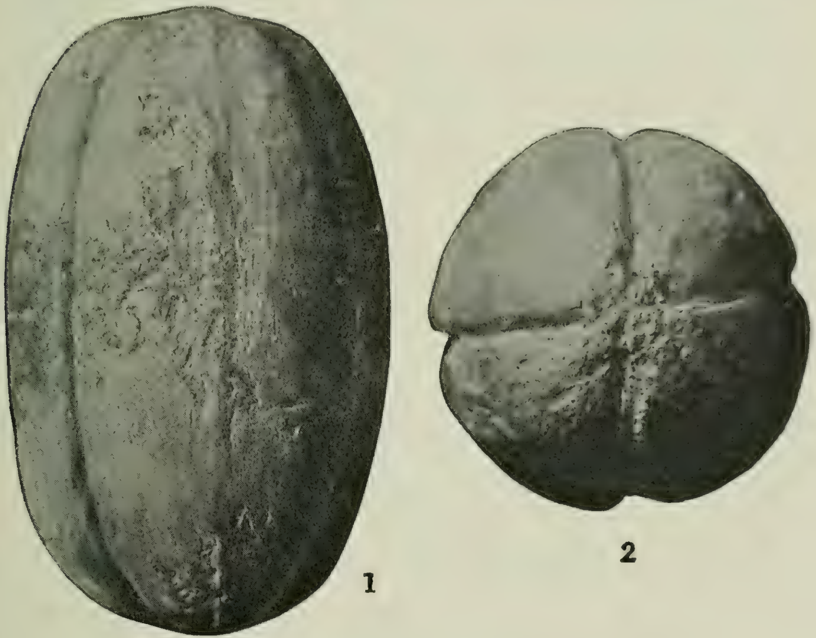
A CUCURBITACEOUS FRUIT FROM THE TERTIARY OF TEXAS

The large fruit which is the subject of the present contribution was sent to me in 1921 by Professor O. M. Ball of the Agricultural and Mechanical College of Texas, who obtained it from a student who had picked it up on the surface in Foard County, in that state.

According to the geological map of Texas published by the University of Texas in 1919, the whole of Foard County is underlain



CALCOPHYSOIDES BALLI gen. et sp. nov. Nat. size
1. From side 2. From end

by undifferentiated Permian. About fifty miles to the west of the County the eastern boundary of the Cenozoic deposits of the Great Plains province is placed. These last comprise the Panhandle and Clarendon Miocene, the Blanco Pliocene, the Tule or Rock Creek Pleistocene, and other unnamed deposits. Some of these undoubtedly extend farther to the eastward than they have been mapped, and it was from some such outcrop of unconsolidated Tertiary, possibly of very limited extent, that the present fossil was obtained.

I was impressed with its resemblance to the capsular fruits of various members of the order Malvales and entertained no doubt but that its determination would prove to be a simple matter. Such was not the case, for a diligent search of collections and of the literature, and consultation with a number of systematic botanists proved to be without results of any value.

Exteriorly the specimen appeared to represent a coriaceous or ligneous, four-valved, indehiscent capsule with parietal placentae, suggesting comparisons with various existing Sterculiaceae and Bombacaceae such as the genera Pachira, Bombax, Bombacopsis, Tribroma, etc. All these are, however, normally five-celled. The African genus Bersama of the family Meliaceae is the only one that came to my notice that has somewhat similar, large, four-celled capsules. Among fossil forms there was a great superficial resemblance to the Wilcox Eocene genus Sterculiocarpus, also five-celled.

Sections of the fossil fruit at once revealed the fact that, despite its appearance, it was not capsular in nature, since there are no traces of partitions in the transverse section, and it became evident that the specimen represented an interior cast of a hard shelled, gourd-like fruit, and I have no doubt but that it should be referred to the family Cucurbitaceae. A new genus is here proposed for its reception, and, because of its resemblance to the tropical American genus Calycophysum of Triana, this new genus is called Calycophysoides, and the species is named in honor of Professor Ball. It may be described as follows:

Calycophysoides balli gen. et sp. nov.

Fruit a gourd, prolate spheroidal in shape, the interior cast 8.3 centimeters in length and 5.1 centimeters in maximum diameter, with four parietal placentae not equally spaced nor equally developed, in life filled with pulpy material and containing numerous small seeds. What appear to be the outlines of seeds are preserved around the periphery of thecast where they have been eroded out or rotted away subsequent to calcification. These appear to have been relatively small, 3 to 4 millimeters in length, broader and more rounded at one end, bluntly pointed at the other, and with one diameter greater than the other, that is, they were slightly compressed. Allowing for the hardened pericarp which permitted the formation of the cast, the specimen

in life would have been at least 10 centimeters long and 6 centimeters in maximum diameter.

I have naturally not seen as much recent comparative material as I should like, but I have been impressed with the resemblance between the fossil and the fruits of the modern genus Calycophysum, which, according to Pittier, embraces at least five species of vines of valleys below about 4000 feet in Colombia, Venezuela, Ecuador, and Bolivia. It may be, of course, that some related genus whose fruits I have not seen, as for example, in the genus Sicana, may be more similar to the fossil, and there may still exist, in the Mexican region, a less decidedly tropical member of the Cucurbitaceae which the fossil represents. Those who will take the trouble to compare the accompanying illustrations with Pittier's figures of *Calycophysum brevipes*,* and especially with the section shown on his plate 30, will, I think, be forced to admit the great similarity between the fossil and this modern fruit, and will at least concede that its reference to the Cucurbitaceae is correct.

It is regrettable that the exact age of the fossil can not be determined. It is obviously Tertiary. If it be considered to represent a modern tropical genus it can scarcely be younger than late Eocene or Oligocene. If, on the other hand, it represents a modern genus of the Mexican plateau region, which is suggested by its geographical location, it might very well represent an element in the flora of the Panhandle and Clarendon Miocene, or even the Blanco Pliocene. I am inclined to think that one or the other of the latter alternatives is correct.

EDWARD W. BERRY.

SHORTER NOTES

BULBOUS BLUEGRASS (POA BULBOSA L.)

This grass has been established many years in the lawns of Capitol Square, Richmond, Virginia. It is there regarded with disfavor because while making a beautiful green turf in late fall, winter and early spring, it turns black and apparently dies in June and then makes very unsightly patches. The grass was first brought to our attention in June, 1915, by Mr. John W.

* Pittier, H., Cont. U. S. Natl. Herb., vol. 20, p. 487, pls. 27–30, 1922.

Richardson, of Richmond, but no positive identification was hazarded until February, 1916. At Arlington Farm, Virginia, the grass flowers in April and May, some of the panicles normal but in many the spikelets are proliferous. At Middletown, Connecticut, most of the panicles are normal.

The underground stem of *Poa bulbosa* is a true bulb, about the size of a wheat grain. These lie dormant at Arlington from about June 1 to October 15, but during the rest of the year the grass makes exquisite turf. Planted in Bermuda turf, the two provide a perennial green sward, the *Poa bulbosa* beginning to grow about the time the frost turns the Bermuda brown. In late spring the Bermuda greens up about the time the *Poa* is waning. For this use the grass promises to be of value particularly on golf courses in the South. It is esteemed for this purpose in southern France.

Poa bulbosa also occurs at Ashland, Virginia, and specimens with proliferating heads have been collected in Washington State at Bingen and Walla Walla. According to Prof. F. H. Hillman the bulblets of *Poa bulbosa* occur not uncommonly in alfalfa seed from Turkestan and have been found in alfalfa seed from France and red clover seed from Italy.

Charles V. Piper.

Notes on Some Foreign Crab-Grasses

A number of foreign crab-grasses have recently been introduced for experiments in foreign crop investigations by the United States Department of Agriculture. As it is desired to refer to these under their correct names, in another connection, eleven species heretofore known under various other generic names are here referred to Syntherisma, the oldest valid name* for the crab-grasses.

Syntherisma abyssinica (Hochst.) Newbold.

Panicum abyssinicum Hochst.; A. Rich. Tent. Fl. Abyss. **2**: 360. 1851.

According to Dr. H. L. Shantz this grass is closely grazed by stock in Ukambe Province, Kenia, Africa.

Syntherisma eriantha (Steud.) Newbold.

Digitaria eriantha Steud., in Flora **12**: 468. 1829.

*Hitchcock, U. S. Dept. Agr. Bull. 772: 215. 1920.

This grass is said to be one of the best tropical African sweet grasses for use as a cattle fodder.

Syntherisma exilis (Kippist) Newbold.

Paspalum exile Kippist, in Proc. Linn. Soc. **1**: 157. 1842.

The seeds are known in Sierra Leone, Africa, as *fundi* and are prized as a cereal; Prof. Piper considers this a remarkably promising forage for the southern states.

Syntherisma henryi (Rendle) Newbold.

Digitaria henryi Rendle, in Journ. Linn. Soc. Bot. **36**: 323. 1904.

Introduced from China as a possible forage crop.

Syntherisma iburua (Stapf) Newbold.

Digitaria iburua Stapf, in Kew Bull. Misc. Inf. **8**: 382. 1915.

Iburu is grown as a cereal by the natives of northern Nigeria. It is being tested in this country as a forage crop.

Syntherisma nodosa (Parl.) Newbold.

Digitaria nodosa Parl. Pl. Nov. 39. 1842.

This species is reported by Stapf to be a good fodder in tropical Africa.

Syntherisma parviflora (R. Br.) Newbold.

Panicum parviflorum R. Br. Prodr. 192. 1810.

Reported by B. Harrison, Burringbar, New South Wales, to be a heavy yielder of nutritious fodder and to grow well in sandy soil.

Syntherisma puberula (Link) Newbold.

Digitaria puberula Link, Hort. Berol. **1**: 223. 1827.

A slender annual, native to India, introduced for trial as a possible forage plant.

Syntherisma royleana (Nees) Newbold.

Panicum royleanum Nees; Steud. Syn. Pl. Gram. 47. 1854.

Considered by Prof. Piper to furnish excellent pasturage.

Syntherisma ternata (A. Rich.) Newbold.

Cynodon ternatus A. Rich., Tent. Fl. Abyss. **2**: 405. 1851.

Cultivated for forage in the central provinces of Nigeria.

Syntherisma uniglumis (A. Rich.) Newbold.

Panicum uniglume A. Rich., Tent. Fl. Abyss. **2**: 370. 1851.

Reported by Dr. H. L. Shantz to be an important river-bottom grass in the Belgian Kongo.

PATTY THUM NEWBOLD.

A Genuine Fossil Ophioglossum

Dr. Hollick's recent paper* on "The taxonomic and morphologic status of *Ophioglossum Alleni* Lesquereaux" is especially noteworthy for the admirable new figures he presents. We are agreed, at least, that the fossil has nothing to do with *Ophioglossum*. One objection to the idea that it is a pod is the fact that I could never see two valves in any of the specimens. Were they present they would be indicated by the overlapping

Ophioglossum hastatiforme, twice natural size.

of the very open reticulation. *Dobinea*, on the other hand, is quite a new suggestion, but the marginal venation of that plant (not well shown in Dr. Hollick's figure) is quite unlike that of the fossil.

It is very interesting to now discover a perfectly genuine *Ophioglossum* in our Tertiary rocks. It was discovered by Mr. H. N. Brown of Lander, Wyoming, who transmitted it to Professor I. A. Keyte of Colorado College. It was finally referred to the Museum of the University of Colorado, to which it has been kindly presented. Two specimens were found.

Ophioglossum hastatiforme new species

Lamina elongate, enlarged apically with the outline of a spear-head, the apex broad but acute; spike elongate, formed as usual in the genus, the gradually attenuate end not quite reaching the end of the lamina. Sporangia in about 28 pairs, the series

*Bulletin, Torrey Botanical Club, 50: 207–213. 1923.

about 16 mm. long; expanded portion of the lamina about 8 mm. long and 3.2 wide. The sporophyll not apiculate.

Wind River or Bridger formation, Eocene Tertiary; Tipperary, Wyoming. The plants were possibly immature, but the long lamina accords with the mature condition of such species as the Asiatic *O. pendulum*, although that does not present the outline of a spear-head. The generic reference is, at any rate, quite satisfactory.

T. D. A. Cockerell.

BOOK REVIEW

The New York Walk Book* while meant for hikers should be of interest to all botanists in the neighborhood of New York. In the introduction the author states that "if this book seems to imply that scenery and climbing and rocks and mileage are the main goal for walkers, it is not for any lack of appreciation of the lure and variety of rewards offered by hunts for trees and all growing things, birds and all moving things, snow tracks or winter buds." The book divides the region within some fifty miles of the city into fifteen districts, briefly describes each as to the general topography and other features, and outlines the best walks that can be taken. These walks are described in detail, beginning with the best ways of reaching the starting points, with the time and cost by trolley or train, the character of the walk—level or hilly, rough or smooth, dry or swampy, the trails and paths to follow, special features of interest, the location of springs, etc. The directions are so detailed and clear that it is hard to see how anyone at all used to the outdoors can lose the trail. Moreover, the directions have such suggestion of wild places, fine views, the possibilities of finding rare plants and the joy of the great outdoors that to read them is to be filled with a great desire to take the trail, "to keep to the ridge to a fine spring under an ash tree, to follow along the ridge through the briar patch and the wild apple orchard, up the nose of the hill past a fine boulder." The botanist certainly will find much of interest

* New York Walk Book, Raymond Torrey, Frank Place and Robert L. Dickinson, The American Geographical Society, Broadway at 156th Street, New York. Pocket Edition, thin paper and flexible covers, $2.00; Special Library Edition, heavier paper and fifteen half tones, $4.00.

on a walk that offers patches of prickly pear on a wood road "that runs through an abandoned farm and then through primeval forest. After three quarters of a mile of this one comes to a lane to the left lined with cedars. Following this down to the edge of Franklin Lake—by leaving the birches and keeping straight ahead one comes to a brook trickling down a cascade." But all of the one hundred and more walks, varying from two to sixteen miles for one-day hikes with a few longer ones for week-end trips, are full of such suggestive notes. Following the descriptions is an appendix with a list of outing clubs (the Torrey Botanical Club and the Wild Flower Preservation Society are listed), of stopping places for overnight hikes, of equipment for the trail, of fire laws and regulations in New York, Pennsylvania, Connecticut, and Massachusetts, of geology and physical geography of the district and of the plant life. The book contains nine maps, modified from the U. S. Geological Survey, and eighty pen and ink sketches.

G. T. Hastings.

PROCEEDINGS OF THE CLUB

Meeting of October 9, 1923

The meeting was held at the American Museum of Natural History.

Mr. E. P. Larkin, Flushing, N. Y., and Miss Zaida Nicholson, New York City, were elected to membership.

The Secretary announced, with regret, the death of two members, that of Mr. William S. Opdyke on Oct. 20, 1922, and that of Prof. W. W. Rowlee on August 8, 1923.

The program of the evening consisted of informal reports on summer work and excursions.

Dr. Denslow stated that he had spent ten weeks in Fairlee, Vermont, and that in nine previous summers he had found in that town a total of 33 species of orchids within a radius of about 2½ miles. This year one species, *Calopogon pulchellus*, was added to the previous number. On the 7th of July, about 500 plants of *Cypripedium hirsutum*, the showy lady's slipper, were found in one swampy locality. One of the flowers, showing a double lip, was sent to the herbarium of the N. Y. Botanical Garden. At Hewitt, New Jersey, later in the season, the fringed

gentian was seen to be abundant on the sides of a rocky railway cut.

Dr. W. A. Murrill, through notes read by the Secretary, referred to various expeditions for the collection of fungi, one to Florida in March, reported in full in the *Journal of The N. Y. Botanical Garden* for July and also in the *N. Y. Times;* one to Mountain Lake and Blacksburg, Virginia, on account of which is forthcoming in the *Journal*, and fungus notes which appeared in *Mycologia* for September; and a visit to Woodstock and Yama Farms in the Catskills, a report of which will appear in *Torreya*. Dr. Murrill was also at the Interstate Park several times to assist Girl Scouts in their nature-study work.

Dr. Tracy E. Hazen reported that he spent his summer at Woods Hole, Mass., with a vacation later on Grand Manan, New Brunswick. Much of the time at Woods Hole was devoted to the identification of fresh water algae collected on Penikese Island as a part of an attempt to make a list of the plants on that island for comparison with a list published by Dr. David Starr Jordan fifty years earlier. An apparently new species of *Chlamydomonas* discovered on Penikese was found later on Grand Manan.

Mr. A. T. Beals reported on week-end trips to various points in the local flora area. All swamps were found to be unusually dry. In Bushkill, Pa., and Closter, N. J., *Ranunculus delphinifolius* was collected. Special attention was given to slime-moulds, several species of which were exhibited. Mr. Robert Hagelstein had reported to him the collection of eighteen species of slime-moulds from one log during the season. The different species appear to have different times for maturing, September being the culminating month for many of them.

Dr. M. A. Howe reported an abundance of the fringed gentian at Pleasantville, N. Y., in meadows where fresh seeds were sown several years previously by Dr. George F. Norton. He mentioned also the occurrence of *Gentiana linearis* Froel. at Newfane, Vermont.

Miss Pauline Kaufman mentioned visits to Arcadia, Sound Beach, Conn., and to Monachie, New Jersey.

MARSHALL A. HOWE,
Secretary.

Meeting of October 31, 1923

The meeting was held at the Museum of The New York Botanical Garden.

In the matter of an invitation to send a delegate to the Joseph Leidy Commemorative Meeting to be held in Philadelphia on December 6, it was agreed to leave the selection of a delegate to the Secretary.

Letters from various European institutions asking for donations of the Club's publications or proposing exchanges therefor were read and it was voted to refer the matter to a special committee to be appointed by the Chairman.

Mrs. Wheeler H. Peckham, New Rochelle, N. Y., was elected to membership.

The scientific program consisted of a discussion by Dr. N. L. Britton and Mr. William Beebe of "Plants of the Galapagos Islands," collected on the Williams Expedition of the N. Y. Zoological Society.

Dr. Britton, introducing the subject, alluded to the isolation of Galapagos Islands, lying in the Pacific Ocean near the Equator, about 650 miles west of Ecuador and 900 miles southwest of Panama. He referred to Charles Darwin's visit in 1835 as naturalist of the voyage of The Beagle, and to the impetus given to the evolutionary theory by Darwin's observation that tortoises from the different islands showed characteristic differences. There is considerable literature on the flora of these islands, the most comprehensive paper being Dr. Alban Stewart's "A Botanical Survey of the Galapagos Islands," published in 1911, and listing 615 species and varieties of spermatophytes and pteridophytes. Dr. Stewart spent more than a year in the archipelago in 1905–'06. Darwin thought that 50% of the plants and animals were endemic. Increasing knowledge has reduced the proportion of endemic species to about 40%. There have been two theories as to the origin of the fauna and flora of the Galapagos. One assumes the existence of an ancient bridge of land connecting the islands with the continent; the other assumes that the islands were always islands and that seeds and plants have been brought there by birds, winds and waves, etc. Some of the endemic species of plants show many races or varieties.

One of the most common grasses in the collection is *Eragrostis*

cilianensis, a weed. There are three or four species of sedges among the plants collected by the Williams Expedition. There are many amaranths, mostly endemic. A *Portulaca* or an allied plant has been revived from a supposedly dried specimen and is now thriving in the greenhouses of The N. Y. Botanical Garden. A heavily armed *Parkinsonia* is sometimes called the Jerusalem Thorn. There are numerous species of Croton, Euphorbia, and allied genera. *Croton Scouleri* has eight or nine varieties. An endemic species of *Waltheria* and two kinds of cotton, *Gossypium Klotzchianum* and *G. Darwinii* are found. There is an endemic *Lantana*, closely related to a South American species, and also a yellow-flowered *Cordia*, related to one of the mainland. Also an endemic species of *Coldenia*. Lichens are abundant on rocks.

Mr. Beebe emphasized the thorny character of the vegetation, this peculiarity interfering seriously with travel. He and his companion, Prof. W. M. Wheeler, had been able, however, to penetrate to a distance of five miles from the coast, while their predecessors, he believed, had gone only three miles. Small meadows with rich red soil covered with *Cenchrus* seemed to offer easy traveling but proved quite otherwise. There was frequent or nearly constant rainfall in the interior but it was very arid along the coast. The rock is porous tufa and lava, and the only stream is a small one on Chatham Island. The highest mountain has an elevation of about 5,000 feet and is clothed with a rather dense vegetation. *Elaphrium graveolens* appears to be the principal tree. Four-fifths of the flowers are yellow. In its general appearance the vegetation suggests that of the South African veldts. The members of the Williams Expedition gave more special attention to the animal life. Certain lizards were observed to eat cacti, spines and all. They also climbed trees and ate the leaves. The big tortoises are now nearly extinct. The birds, sea-lions, and animals in general showed no fear of man. Mr. Beebe found nothing to indicate original isolation of the Galapagos Islands group. The Humboldt Current and the prevailing winds are from the southeast. The nearest relatives of the animals, with the exception of sea-lions and penguins, are found in Central America and Mexico—to the northwest.

Mr. R. S. Williams made a brief report on the mosses of the

Galapagos Islands, stating that about one-third of the species are endemic, and that the others occur in Central America and northern South America.

MARSHALL A. HOWE,
Secretary.

NEWS NOTES

The Wild Flower Preservation Society of America distributed during the holiday season leaflets on the preservation of the plants used as Christmas greens. The balsam tree is recommended for Christmas trees. The statement is made that *six hundred years* of Holly life is extinguished in one puny "3 x 2 x 2 ft. florist's box." The society also prepared stickers in red and green for envelopes with the message HOLLY AND LAUREL are fast disappearing, use substitutes.

Dr. J. Arthur Harris, who for a number of years has been a member of the staff of the Station for Experimental Evolution of the Carnegie Institution at Cold Spring Harbor, and a member of the editorial board of the Torrey Botanical Club, has been elected Professor of Botany and Head of the Department of Botany of the University of Minnesota. He expects to take up his new duties in September of the present year.

Dr. William Crocker, Director of the Boyce Thompson Institute of Plant Research of Yonkers, N. Y., has been elected President of the Botanical Society of America. Dr. A. F. Blakeslee of the Station for Experimental Evolution at Cold Spring Harbor, N. Y., is the new Vice-president of the Society.

Dr. and Mrs. N. L. Britton left New York on January 26th for a two months' visit to Porto Rico, where they will continue their investigations of the Flora of Porto Rico and the Virgin Islands.

The Torrey Botanical Club

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OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

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(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

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BY

GEORGE T. HASTINGS

John Torrey, 1796-1873

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TORREYA

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March-April, 1924

CUP-FUNGI* OF COMMON OCCURRENCE

Fred J. Seaver

As spring opens the nature lover is glad to welcome the return of the flowers which occur with such surprising regularity in the same region year after year. He will not hesitate to predict what species will be found at any given time and place barring unusual climatic conditions.

Few realize that many of the fungi occur with the same regularity and that, indeed, what we call the fungus merely corresponds to the flowering and fruiting stage of the higher plants, and that their growing stage persists, unseen, in the soil or other substratum throughout the year and often for many years or until the substratum itself becomes so changed chemically that it can no longer support this kind of life. So if sufficiently observant one can also predict the fungus flora of any given region for any particular period with about as much certainty as that of the flowering plants, provided the rainfall is normal.

Taking as an illustration the cup-fungi, including the most conspicuous and attractive forms of the higher fungi belonging to the group known as the ascomycetes, we find the group made up of early spring, summer, and autumn species while others like many of the flowering plants continue to fruit throughout the warm or growing season. The fruiting time of some species is limited to a single month in a given region which in warmer or colder parts may be shifted a month forward or backward as the case may be.

For the benefit of local workers who are interested in out-of-door excursions, we will enumerate a few of the cup-fungi which

* An illustrated volume on the Cup-Fungi of North America is in course of preparation by the writer and to this end, specimens, photographs or data bearing on the occurrence and distribution of any of the species will be gladly received, as well as the names of any who might be interested in securing such a volume when completed.

may be expected during the different periods of the year. These usually occur in shaded places in woods, in the borders of woods, or more rarely in open places.

Early Spring Species

The scarlet cup (*Sarcoscypha coccinea*) is one of the first to appear in the spring as soon as the frost is out of the ground. The cups grow from sticks in the woods and are externally whitish with the interior scarlet-red and reach a diameter of one or two inches. Like some of the early spring flowers if the season is sufficiently open the scarlet cup may rarely be found in the late autumn apparently in anticipation of the springtime.

The black urn (*Urnula Craterium*) like the preceding occurs early in the spring from March to May or rarely extending over to June. It first appears in the form of a row of black fingers growing from partially buried sticks. Later these club-shaped bodies open and expand into the form of an urn suggesting the above name. The fruiting bodies when mature are two or three inches across and supported by a stout stem.

The tuberous cup-fungi (*Sclerotinia tuberosa* and *Sclerotinia Geranii*) have been collected together in the same restricted region for a number of years, their fruiting season being limited to April and May. The appearance of the two named species can be predicted in that place next spring with as much certainty as the appearance of any of the flowering plants which persist in the ground from year to year.

The spring mushroom (*Morchella esculenta*) or "honeycomb" mushroom as it is sometimes called makes its appearance in this section almost exclusively in the month of May, although it may come in April a little further south. All of the specimens seen from New York State were collected in May. This species may also be found year after year in the same place and is one of the most important edible species of cup-fungi.

Late Spring or Summer Species

Closely related to the large scarlet cup which appears so early in the spring are the hairy cup and the smaller western form of the scarlet cup (*Sarcoscypha floccosa* and *Sarcoscypha occidentalis*). In sharp contrast to the scarlet cup these forms occur from May

to July or August and like their larger relative attract much attention because of their brilliant color.

Occurring about the same time are the species of *Acetabula* so called because of their resemblance to the ancient vinegar-cup whatever that may have been. The two forms shown in the accompanying plate (*Acetabula sulcata* and *Acetabula vulgaris*) are frequently collected but can scarcely be said to be common. The former is characterized by its fluted stem and the latter by the veins which adorn the exterior of the cups.

The saddle fungi occur in the late spring and extend through until autumn. In these types the fruiting body consists of a stem with a cap which is inclined to assume the form of a saddle suggesting the name. The white saddle-fungus (*Helvella crispa*), shown on plate, is often encountered.

The brain fungus (*Gyromitra esculenta*) also shown on the accompanying plate is closely related to the former and is often treated in the same genus. The cap in this form is convoluted into brain-like folds. As the name implies the species is edible, as are most of the cup-fungi.

The orange cup (*Aleuria aurantia*) although often seen in the spring is far more abundant in September and October. This species may be easily recognized by the decidedly orange colored cups reaching a diameter of one to two inches.

The revolute cup (*Peziza repanda*), shown on the plate, may be found during the summer and autumn on rotten logs and stumps. The cups become very large often several inches in diameter and flatten out, often with the margin turned back.

Autumn Species

While many species extend through to the autumn a number are distinctly fall species. Among these is the shield-shaped species (*Peziza clypeata*) which may be found on rotten logs from September until November or until freezing weather interferes with its growth. This species has been collected by the writer on the same log for a number of years in succession, always occurring at about the same time in the autumn.

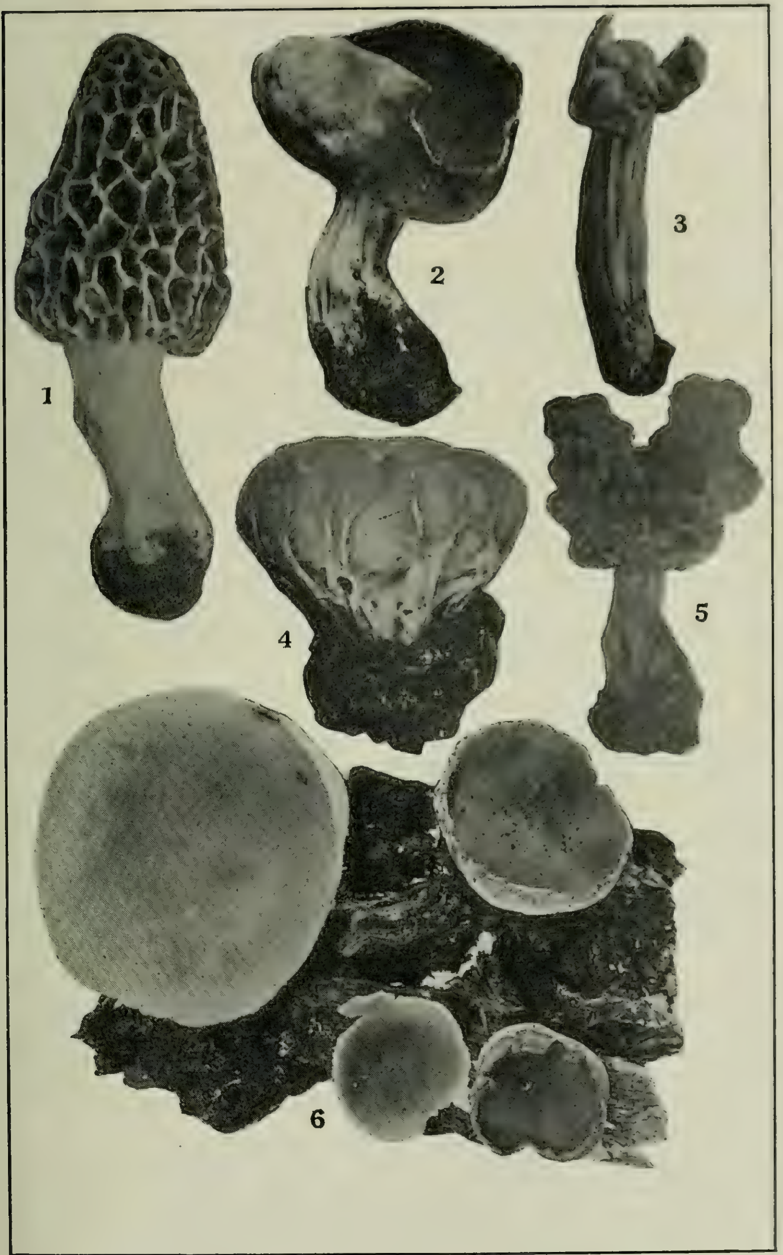
A cluster of cup-fungi (Sclerotinia) puffing their spores.

Spore Dispersal

One of the most interesting phenomena in connection with this group of fungi is that of the puffing of their spores. The spores in this type of fungus are borne in sacs, for the most part cylindrical, and usually eight in each sac or ascus. These are held under tension. At the slightest atmospheric disturbance, thousands or perhaps millions of these sacs discharge their contents into the air where the minute spores appear like a cloud of dust and are borne away by the slightest breeze. Through the courtesy of Cornell University, I am permitted to reproduce the rather remarkable photograph made by Mr. Fisher, photographer for the Department of Plant Pathology of that institution. Anyone collecting cup-fungi will be able to observe the smoking or puffing of their spores.

Explanation of Plate

1. Spring or honeycomb mushroom, *Morchella esculenta.*
2. Fluted Acetabula, *Acetabula sulcata.*
3. White saddle-fungus, *Helvella crispa.*
4. Common Acetabula, *Acetabula vulgaris.*
5. Brain-fungus, *Gyromitra esculenta.*
6. Revolute cup, *Peziza repanda*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THE FLORA OF THE TOWN OF SOUTHOLD, LONG ISLAND AND GARDINER'S ISLAND, NEW YORK

Stewart H. Burnham and Roy A. Latham

Fourth Supplementary List*

INSECT GALLS

Neuroterus noxiosus Bass.—Leaves of *Quercus Prinus* at Greenport; determined by Dr. M. D. Leonard.

Phyllocoptes quadripes Shim.—Leaves of *Acer rubrum* at Greenport; determined by Dr. Leonard.

MYXOMYCETES

Badhamia rubiginosa (Chev.) Rost.—Old leaves; determined by Prof. John Dearness.

Clathroptychium rugulosum (Wallr.) Rost.—Orient on bark of *Juniperus virginiana;* determined by Prof. Dearness.

Cribraria rufa (Roth) Rost.—Old wood at Southold; determined by Prof. Dearness.

Hemitrichia vesparium (Batsch) Macbr.—Greenport; determined by Prof. Dearness.

Stemonitis splendens Rost.—Rich woods on rotten wood at Greenport; determined by Prof. Dearness.

EUPHYCEAE

Lithothamnion polymorphum (L.) Aresch.—On stones in the Sound at Orient; determined by Dr. R. W. Miner.

PHYCOMYCETES

Aspergillus candidus Link—Orient on dead plants; determined by Prof. Dearness.

Peronospora Arthurii Farl.—On *Oenothera*, Southold; determined by Prof. Dearness.

ASCOMYCETES (excluding PYRENOMYCETES)

Aleuria repanda (Pers.) Gill.—Inside woodpecker's hole of an apple tree at Greenport; determined by Prof. Dearness.

Ascobolus Crouani Boud.—Old stems of Brussels Sprouts, *Brassica oleracea gemmifera* at Orient; determined by Prof. Dearness.

* The Preliminary flora was published in Torreya **14**: 201–225, Nov. 1914 and 229–254, Dec. 1914. The First Supplementary list was published in Torreya **17**: 111–122, July 1917. The Second Supplementary list was published in Torreya **21**: 1–11, Jan.–Feb. 1921 and 28–33, March–April 1921. The Third Supplementary list was published in Torreya **23**: 3–9, Jan.–Feb. 1923 and 25–31, March–April 1923.

Cudoniella marcida (Müll.) Sacc.—The note in the Third Supplementary list was published in Dr. C. G. Lloyd's Mycol. Notes **68**: 1182, fig. 2387. Jan. 1923.

Helvella elastica Bull.—Earth in dry woods at Mattituck; determined by Dr. C. G. Lloyd.

Leotia chlorocephala Schw.—Earth in dry woods at Laurel; determined by Dr. Lloyd and reported in Mycol. Notes **69**: 1188. July 1923.

Orbilia vinosa (A. & S.) Karst. Dead twigs in a swamp at Laurel; determined by Dr. Chas. E. Fairman.

Phialea Aspegrenii (Fr.) Gill.—Old twigs in rich woods at Mattituck; determined by Prof. Dearness.

Pyrenopeziza subatra (C. & P.) Sacc.—On *Solidago* at Orient; determined by Prof. Dearness.

PYRENOMYCETES

Caryospora Putamium (Schw.) DeNot.—On peach, *Prunus Persica* pits at Orient; determined by Dr. Fairman.

Chaetomium elatum Kuntze—On *Quercus velutina* at Orient; determined by Prof. Dearness.

Diaporthe Baccharidis (Cke.) Sacc.—On *Baccharis halimifolia;* determined by Prof. Dearness.

Diaporthe oncostoma (Duby) Fckl.—On *Amelanchier canadensis* at Orient; determined by Prof. Dearness.

Diatrype asterostoma B. & C.—On *Amelanchier* at Orient; determined by Prof. Dearness.

Diatrype bullata (Hoffm.) Fr.—On *Acer platanoides* at Orient; determined by Prof. Dearness.

Diatrype fibritecta C. & E.—Orient on dead branches of *Juniperus virginiana* lying on the ground; determined by Prof. Dearness, who says, "a fine thing."

Diatrype Maclurae E. & E.—On *Rhus Toxicodendron*, var. *radicans* at Orient; determined by Prof. Dearness.

Erysiphe graminis DC.—On wheat, *Triticum aestivum* at Orient; determined by Prof. Dearness.

Eutypa ludibunda Sacc.—On *Gleditsia triacanthos* at Orient; determined by Prof. Dearness.

Eutypella constellata (B. & C.) E. & E.—Greenport on *Carya glabra;* determined by Prof. Dearness.

Eutypella glandulosa (Cke.) E. & E.—On *Ailanthus glandulosa* at Mattituck; determined by Prof. Dearness.

Hypomyces chrysospermus Tul.—The conidial form *Sepedonium* on *Boletus;* determined by Dr. Lloyd and reported in Mycol. Notes **69**: 1188. July 1923.

Hysterium angustatum A. & S.—Orient on twigs of *Crataegus Crus-galli;* determined by Prof. Dearness.

Hysterographium Mori (Schw.) Rehm, var. *Gerardi* C. & P.—On *Prunus serotina* at Orient; determined by Prof. Dearness.

Hysterographium Putamium (Cke.) Sacc.—On pits of *Prunus maritima* at Southold; determined by Dr. Fairman, who says, "a rare species."

Lophodermium arundinaceum Chev., var. *culmigenum* (Fr.) Fckl.—Mostly *Leptostromella hysterioides* Sacc. On *Triticum aestivum* at Mattituck; determined by Prof. Dearness.

Melanconiella Decoraensis (Ellis) Sacc.—"Dead branches of *Betula populifolia* Marsh., Orient, Long Island, Roy Latham, March 1919. Determined by Dearness." N. Y. State Mus. Bull. **243–244:** 85. Issued May 15, 1923.

Metasphaeria defodiens (Ellis) Sacc.—Stems of *Juncus dichotomus*, Southold; determined by Prof. Dearness, who says, "near this" species. "The only record I know for this is Iona, N. J."

Phyllachora Agrostidis Orton—"On leaves of *Agrostis alba.* Orient, Long Island, Roy Latham, no. 610, October 18, 1914. Determined by Dr. C. R. Orton." N. Y. State Mus. Bull. **243–244:** 91. Issued May 15, 1923.

Phyllachora puncta (Schw.) Orton—"Leaves of *Panicum Wrightianum,* Southold, Latham, no. 611, November 4, 1914. Determined by Dr. C. R. Orton." N. Y. State Mus. Bull. **243–244:** 92. Issued May 15, 1923.

Phyllactinia corylea (Pers.) Karst.—Leaves of *Betula populifolia* at Greenport; determined by Prof. Dearness.

Physalospora thyoides (C. & E.) Sacc.—On *Juniperus virginiana* at Orient; determined by Prof. Dearness.

Rosellina albolanata E. & E.—On *Quercus velutina;* determined by Dr. Fairman.

Trematosphaeria pertusa (Pers.) Fckl.—Pits of Burbank plum, *Prunus trifolia* x; determined by Dr. Fairman.

Valsa Hoffmanni Nke.—Greenport on *Crataegus Crus-galli;* determined by Dr. Fairman.

Valsa leucostoma (Pers.) Fr.—Orient on *Malus;* determined by Prof. Dearness.

Valsa obtecta C. & E.—On *Clethra alnifolia* at Laurel; determined by Prof. Dearness.

Xylaria apiculata Cke.—Bark of living oak at Greenport; determined by Dr. Fairman, who says, "According to Lloyd. In Rehm Ascomycetes, No. 1912, a similar thing is called *X. arbuscula* Sacc., var. *biceps* Speg."

Xylaria brasiliensis (Theiszen)—The note in the Third Supplementary list was published in Dr. Lloyd's Mycol. Notes **68:** 1175, fig. 2338. Jan. 1923.

HYPOMYCETES

Alternaria Solani (E. & M.) Jones & Grout—On *Solanum tuberosum*, common; determined by Prof. Dearness.

Cercospora Symplocarpi Pk.—On *Symplocarpus foetidus* at Greenport; determined by Prof. Dearness.

Cercospora varia Pk.—On *Viburnum dentatum* at Greenport; determined by Prof. Dearness.

Cladosporium epimyces Cke.—On *Pleurotus ostreatus* at Orient; determined by Prof. Dearness.

Helminthosporium obclavatum Sacc.—Orient on *Juniperus virginiana;* determined by Prof. Dearness.

Heterosporium gracile (Wallr.) Sacc.—Orient on *Iris;* determined by Prof. Dearness.

Isaria farinosa (Dicks.) Fr.—On pupa in rich woods at Mattituck. Determined by Dr. Fairman, who says, "It is probably the var. *prolifero-ramosa* of Saccardo, though I have not seen this and have no record of its finding in this country."

Ramularia Plantaginis Ell. & Mart.—Orient on *Plantago Rugeili;* determined by Prof. Dearness.

Septocylindrium aromaticum Sacc.—Southold on *Acorus Calamus;* determined by Prof. Dearness.

Stilbum erythrocephalum Ditm.—Orient on droppings of chickens; determined by Dr. Fairman.

Trichothecium roseum (Pers.) Link—On stems of *Akebia quinata* at Orient; determined by Prof. Dearness.

Tubercularia rosea Schreb.—*Illosporium roseum* (Schreb.) Mart. Orient on pine wood. Determined by Dr. Lloyd, who says, "*Tubercularia rosea* from Roy Latham, New York. We name this only as a guess or rather two guesses. First, that it answers the 'description,' habits, etc., of *Dacryomyces roseus* as named by Fries, and second, that *Dacryomyces roseus* is really a *Tubercularia.* All these little gelatinous plants were called *Dacryomyces* or *Tremella* by the old namers who did not examine them with the microscope. It is a very small rose-colored tremellaceous cushion growing on a mossy substratum which fits '*Dacryomyces roseus.*' That is about all I think anyone knows about it." Reported in Mycol. Notes **69:** 1211. July 1923 as "Note 1180."

MELANCONIALES

Gloeosporium fructigenum Berk.—Old fruit of *Pyrus communis* at Orient; determined by Prof. Dearness. A stage of *Glomerella cingulata* (Atks.) S. & S.

Myxosporium subviride E. & E.—Greenport on *Betula;* determined by Prof. Dearness.

SPHAEROPSIDEAE

Aposphaeria nucicola E. & E.—Orient on nuts of *Carya glabra;* determined by Dr. Fairman.

Aposphaeria Putamium (Speg.) Sacc.—Pits of German prune, *Prunus domestica* at Orient; determined by Dr. Fairman.

Ascochyta Dianthi (A. & S.) Berk.—Orient on *Dianthus Armeria;* determined by Prof. Dearness.

Ascochyta Philadelphi Sacc. & Speg.—On *Philadelphus coronarius*, Laurel, no. 1137; determined by Dr. Fairman, who requested that the

following notes be published. "*Ascochyta Philadelphi* Sacc. & & Speg.? Pycnidia scattered, subepidermal becoming erumpent, globose depressed, centrally ostiolate, of delicate pseudo pycnidial structure, brown or black, about 200 μ in diam.; spores numerous, ellipsoid, rounded at the ends, at first continuous and unconstricted, becoming with age uniseptate and slightly constricted at the middle, greenish hyaline, $7.5 \times 3.5 \mu$. On living or languishing stems of *Philadelphus* sp. Laurel, N. Y. This is probably the stem form of the above species. The specimens are in a young condition and show mostly Phoma-like spores."

Ascochyta Pisi Lib.—Mattituck on *Vicia;* determined by Prof. Dearness.

Camarosporium Berkleyanum (Lev.) Sacc.—On *Ailanthus glandulosa*, Mattituck; determined by Prof. Dearness. *Camarosporium subfenestratum* (B. & C.) Sacc. of some botanists.

Dinemasporium hispidulum (Schrad.) Sacc., var. *herbarum* Cke.—Stems of *Thalictrum revolutum* at Orient; determined by Prof. Dearness.

Discosia Artocreas (Tode) Fr. (*Discosia faginea* Lib.)—Greenport on leaves of *Fagus grandifolia;* determined by Prof. Dearness.

Discula Platani (Pk.) Sacc.—Orient on branches of *Platanus occidentalis;* determined by Prof. Dearness.

Haplosporella Bignoniae (Schw.) Starb.—On *Teccma radicans* at Orient; determined by Dr. Fairman.

Haplosporella Dulcamara Dearn. & House—"On dead stems of *Solanum Dulcamara* L., Sandlake, Rensselaer County, Dr. C. H. Peck (Type), year not indicated. Orient, Long Island, Roy Latham, 1916. . . ." N. Y. State Mus. Bull. **243–244:** 75. Issued May 15, 1923.

Hendersonia Desmazieri Mont.—Orient on *Platanus occidentalis;* determined by Prof. Dearness.

Leptostroma herbarum (Fr.) Link—Laurel on *Dioscorea villosa;* determined by Prof. Dearness.

Leptostroma Pinastri Desm.—Needles of *Pinus rigida* and *P. Strobus*, throughout the region; determined by Prof. Dearness.

Phoma glandicola (Desm.) Lev.—On insect galls on *Quercus alba* at Greenport; determined by Dr. Fairman.

Phoma Mariae Clinton—Orient on *Lonicera japonica;* determined by Prof. Dearness.

Phoma subcircinata E. & E.—Pods of *Phaseolus lunatus* at Cutchogue; determined by Dr. Fairman.

Phoma Syringae B. & C.—Orient on *Syringa vulgaris;* determined by Prof. Dearness.

Phomopsis depressa (Lev.) Trav.—Orient on *Syringa vulgaris;* determined by Dr. Fairman.

Phomopsis epicarpa Sacc.—Pods of *Robinia Pseudo-Acacia* at Orient; determined by Dr. Fairman.

Phyllosticta Amaranthi Ell. & Kell.—Laurel on *Acnida tuberculata;* determined by Prof. Dearness, who says that he is "not aware that this has been collected on *Acnida* before."

Phyllosticta Lappae Sacc.—Orient on *Arctium minus;* determined by Prof. Dearness.

Phyllosticta latifoliae E. & E. —Greenport on *Kalmia latifolia;* determined by Prof. Dearness.

Phyllosticta Nyssae Cke.—Greenport on *Nyssa sylvatica;* determined by Prof. Dearness.

Phyllosticta smilacina (Pk.) Dearn.—(*Sphaeropsis smilacina* Pk.)—On leaves of *Smilax* at Southold and Orient; determined by Prof. Dearness.

Septoria carpogena E. & E.—Old fruit of *Celtis occidentalis* at Mattituck; determined by Dr. Fairman.

Septoria Celtis-gallae Gerard—Old galls on *Celtis occidentalis* at Mattituck; determined by Dr. Fairman.

Septoria lepidiicola Ell. & Mart.—On *Lepidium* at Orient; determined by Prof. Dearness.

Sphaeronema clethrincolum Ell.—Greenport on *Clethra alnifolia;* determined by Prof. Dearness.

Sphaeropsis Betulae Cke., var. *lutea* Dearn. & House—On *Betula populifolia* at Orient; determined by Prof. Dearness. The variety on dead branches of *Betula lutea* is described in N. Y. State Mus. Bull. **243-244:** 79. Issued May 15, 1923.

Sphaeropsis Cydoniae C. & E.—Orient on *Cydonia japonica;* determined by Prof. Dearness.

Sphaeropsis pericarpii Pk.—On nut of *Carya glabra* at Orient; determined by Dr. Fairman.

Sphaeropsis Sassafras C. & E.—Orient on *Sassafras;* determined by Prof. Dearness.

Sphaeropsis simillima Pk.—On *Acer rubrum* and *Acer platanoides* at Orient; determined by Prof. Dearness.

USTILAGINACEAE

Ustilago sphaerogena Burr.—Orient on *Echinochloa Walteri;* determined by Dr. H. S. Jackson.

PUCCINIACEAE

Aecidium Apocyni Schw.—On *Apocynum androsaemifolium* at Mattituck; determined by Dr. Jackson.

Cronartium cerebrum (Pk.) Hedgc. & Long—Peconic on *Pinus rigida;* determined by Prof. Dearness.

Cronartium comptoniae Arth.—Southold on *Pinus rigida;* determined by Dr. Jackson.

Earlia speciosa (Fr.) Arth.—Cutchogue on *Rosa blanda;* determined by Dr. Jackson. (*Phragmidium speciosum* (Fr.) Cke.)

Puccinia Andropogonis Schw.—On *Chelone glabra* at Greenport; determined by Dr. Jackson.

Puccinia angustata Pk.—On *Lycopus virginicus* at Greenport; determined by Dr. Jackson.

Puccinia asperifolii (Pers.) Wettst.—On *Secale cereale*, common; determined by Dr. Jackson.

Puccinia Asterum (Schw.) Kern—Orient on *Dulichium arundinaceum;* determined by Prof. Dearness.

Puccinia Fraxinata (Link) Arth.—On *Fraxinus americana* at Greenport and Southold; determined by Dr. Jackson.

Puccinia Hibisciatum (Schw.) Kell.—Orient on *Muhlenbergia sylvatica;* determined by Dr. Arthur.

Puccinia Iridis (DC.) Wallr.—Common on *Iris versicolor* at Orient and Greenport; determined by Dr. Arthur.

Puccinia pustulatum (Curtis) Arth.—Orient on *Andropogon scoparius;* determined by Prof. Dearness.

Uredinopsis mirabilis (Pk.) Magnus—"II, III, on fronds of *Onoclea sensibilis* L., Gardiner's Island, Roy Latham, August 1919. On fronds of *Lorinseria areolata* (L.) Presl., [*Woodwardia areolata*] at Greenport, Latham, August 1920. The aecial stage (*Peridermium balsameum* Peck) occurs on *Abies balsamea* (L.) Mill., a host tree, not known to occur on Long Island. It has been collected by Peck on *Anchistea virginica* (L.) Presl., [*Woodwardia virginica*] at Manor, Long Island." N. Y. State Mus. Bull. **243-244:** 85. Issued May 15, 1923.

Uromyces Hedysari-paniculati (Schw.) Farl.—"On leaves of *Meibomia Dillenii* (Darl.) Ktze., [*Desmodium Dillenii*] at Bay View, town of Southold, Long Island, Roy Latham, August 21." (*Nigredo Hedysari-paniculati* (Schw.) Arth.). N. Y. State Mus. Bull. **243-244:** 85. Issued May 15, 1923.

Uromyces seditiosus Kern—Laurel on *Aristida tuberculosa;* determined by Dr. Jackson who says, "new to New York state." Also determined by Prof. Dearness.

TREMELLACEAE

Tremella lutescens Pers.—Old wood at Orient; determined by Dr. Lloyd.

DACRYOMYCETACEAE

Dacryomyces deliquescens (Bull.) Duby—On *Juniperus virginiana* at Orient; determined by Dr. Lloyd. "Note 1181—*Dacryomyces deliquescens* from Roy Latham, New York. This soaks out pale yellow and is *Dacryomyces deliquescens* of American mycology. This collection is the conidial condition and has abundant small globose, hyaline spores about 4 mic. in diameter and borne in chains. It has developed since I have been in Europe and Buller's second volume has appeared that this is not *Dacryomyces deliquescens* of English tradition and of Buller's book. The curious oidium spores of the English plant which are first shown in Buller's book to be on separate bodies from the basidia bearing spore bodies are entirely different from these spores. I do not believe we have the English plant with us, though both countries apply the name *Dacryomyces deliquescens* to their respective plants. In English tradition (started by Berkeley) this oidium form which is deep orange is called *Dacryomyces*

stellatus 'Nees.' That is a taxonomic mistake, for the Neesian plant was shown with furcate basidia and it is the common species of Sweden better called *Dacryomyces abietinus*" Mycol. Notes **69**: 1211. July 1923.

Dacryomyces minor Pk.—The note in the Third Supplementary list was published in Mycol. Notes **67**: 1161. July 1922, as "Note 1130."

Dacryomyces sp.—"A minute *Dacryomyces* from Roy Latham, New York. Mr. Latham sends us decorticate wood, 'a very minute Tremella-like plant.' Mr. Latham has good eyes, for I cannot see it even with a hand lens, neither dried nor soaked. But a scraping under the microscope shows a definite little species of *Dacryomyces*, typical as to basidia and appearance, but no spores found. Its color is pale yellow. I am afraid it is too small to name, though formidable Latin names are applied to more minute plants." Reported by Dr. Lloyd in Mycol. Notes **69**: 1218. July 1923.

THELEPHORACEAE

Stereum lobatum (Kuntze) Fr.—*Stereum versicolor* Fr. of the Preliminary list and *Stereum fasciatum* Schw. of the First Supplementary list should be referred to this species.

POLYPORACEAE

Fomes lucidus (Leyss.) Fr.—On *Acer rubrum* at Greenport; determined by Dr. Lloyd, and listed in Mycol. Notes **69**: 1188. July 1923.

Polyporus circinatus Fr.—Earth in dry woods at Mattituck; listed in Lloyd's Mycol. Notes **69**: 1188. July 1923.

Polyporus cristatus (Pers.) Fr.—Greenport on *Quercus alba;* listed in Lloyd's Mycol. Notes **67**: 1161. July 1922.

Polyporus Spraguei B. & C.—"Note 1109. *Polyporus Spraguei* from Roy Latham, New York. My first impression was that this was not *Spraguei* for I associate a hard, rigid context with the species and this is rather soft and crumbly. I do not find any other difference, however, and to eye it is exactly *Spraguei*." Lloyd's Mycol. Notes **67**: 1161. July 1922.

Polystictus focicola B. & C.—The note in the Third Supplementary list was published in Mycol. Notes **67**: 1164. July 1922, as "Note 1114."

Polystictus perennis (L.) Fr.—Greenport. Listed in Lloyd's Mycol. Notes **69**: 1188. July 1923.

Poria flavescens (Schw.) Cke.—Orient on *Juniperus virginiana;* determined by Dr. E. A. Burt.

Poria viticola (Schw.) Cke.—Orient on *Platanus occidentalis* and Greenport on *Lyonia ligustrina;* determined by Prof. Dearness.

Trametes protracta Fr.—Gardiner's Island on log of *Pinus rigida;* listed in Lloyd's Mycol. Notes **69**: 1188. July 1923.

Trametes pusilla Lloyd.—The note in the Third Supplementary list was published in Mycol. Notes **69**: 1207. July 1923, as "Note 1148."

AGARICACEAE

Lenzites betulina (L.) Fr.—Greenport on *Quercus stellata;* determined by Dr. Lloyd who says, "Your specimen is what is called [Lenzites] *flaccida* (Bull.) Fr."

Mycena haematopa Berk.—Coniferous wood at Orient; determined by Prof. Dearness.

Pleurotus approximans Pk.—Orient on *Baccharis halimifolia;* determined by Prof. Dearness.

Pleurotus niger Schw.—"Note 1179. *Pleurctus niger* from Roy Latham, New York. This would have been of much interest to me years ago, when I was working on agarics. I could never understand why I never found *Pleurotus niger* while the similar little *Pleurotus striatulus* was so frequent. *Pleurotus niger* is truly a black plant with black gills and globose, hyaline 4 mic. spores. The gill margins have large white cystidia (or crystals perhaps)." Lloyd's Mycol. Notes 69: 1211. July 1923.

Psilocybe uda (Pers.) Fr.—Sphagnum at Greenport; determined by Prof. Dearness.

LICHENES

Blastenia ferruginea (Huds.) Arn., var. **discolor** (Willey), n. comb.—Orient on *Juniperus virginiana*, April 25, 1910 and January 9, 1911; determined by Dr. Bruce Fink. Reported in the Preliminary list as *Lecanora* (§ *Callopisma*) *ferrugineum discolor* (Willey). (*Placodium ferrugineum discolor* Willey).

Ramalina Willeyi Howe—Orient on *Juniperus virginiana*, October 1, 1914; determined by Dr. R. Heber Howe, Jr.

HEPATICAE

Cephaloziella byssacea (Roth) Warnst.—Laurel; determined by Dr. Geo. H. Conklin.

MUSCI

Dicranum montanum Hedw.—Base of trees in swamp at Greenport; determined by Mr. Geo. B. Kaiser.

Eurhynchium rusciforme (Neck.) Milde—Gardiner's Island, rocks in a woodland stream; determined by Mr. Kaiser.

Orthotrichum Schimperi Hamm.—Orient on *Robinia Pseudo-Acacia.*

Orthotrichum strangulatum Sull., var.—Rock in woods at Gardiner's Island.

Platygyrium repens (Brid.) B. & S.—Base of trees at Greenport; determined by Mr. Kaiser.

PTERIDOPHYTA

Lycopodium tristachyum Pursh—Orient Point, September 2, 1910.

SPERMATOPHYTA

Potamogeton foliosus Raf.—In a pond at Mattituck; determined at Bureau of Plant Industry, Washington.

Potamogeton hybridus Sheld.—In a pond at Southold; determined at Bureau of Plant Industry.

Festuca Shortii Kunth—The specimen reported in the Third Supplementary list from wet woods at Mattituck; should be referred to *Festuca nutans* Spreng.

Glyceria canadensis (Mx.) Trin.—Swamp at Mattituck; determined by Mrs. Agnes Chase.

Panicum mattamuskeetense Ashe—Laurel; determined by Mrs. Chase.

Panicum Wrightianum Scribn.—Southold, the host of *Phyllachora puncta.* N. Y. State Mus. Bull. **243–244:** 92. Issued May 15, 1923.

Setaria lutescens (Weigel) Hubbard—Sandy field at Laurel; determined by Mrs. Chase.

Carex Howei Mackenzie—Greenport in low wet woods; determined at N. Y. Botanical Garden.

Carex retroflexa Muhl.—Gardiner's Island in dry woods; determined at N. Y. Botanical Garden.

Xyris caroliniana Walt.—Sandy swamp at Laurel, August 17, 1923.

Spiranthes vernalis Engelm. & Gray—Peconic in low grassy fields; determined at N. Y. Botanical Garden.

Juglans nigra L.—One large tree in woods at Mattituck.

Chenopodium murale L.—Orient in waste ground; determined at N. Y. Botanical Garden.

Amaranthus caudatus L.—Occasional as a weed in cultivated and waste grounds at Orient; determined at N. Y. Botanical Garden.

Spergularia canadensis (Pers.) Don—"*Alsine canadensis* (Pers.) House; (*Arenaria canadensis* Pers.; *Spergularia borealis* Robinson)—A species of the northern shores of eastern America, which appears to reach its southern limit of distribution on Shelter Island, opposite Greenport, where collected by Dr. C. H. Peck in 1871 (State Herbarium)." N. Y. State Mus. Bull. **243–244:** 57. Issued May 15, 1923.

Nymphozanthus advena (Ait.) Fernald—Swamp at Laurel, August 16, 1923.

Ranunculus laxicaulis (T. & G.) Darby—Mattituck in a swamp, September 1, 1923.

Arabis lyrata L.—Cultivated fields at Orient; determined at Bureau of Plant Industry.

Potentilla recta L.—Sandy fields at Laurel, July 16, 1923: and Orient, June 20, 1923.

Linum medium (Planch.) Britton—Dry woods at Southold; determined at Bureau of Plant Industry.

Myriophyllum tenellum Bigel.—Sandy shore of a large pond at Southold, August 20, 1923.

Cornus Amomum L.—"Border of swamp near Orient. Roy Latham, September 2." N. Y. State Mus. Bull. **243–244:** 57. Issued May 15, 1923.

Nymphoides lacunosum (Vent.) Fernald—In a pond at Southold, August 20, 1923.

Echium vulgare L.—Laurel in old pastures; determined at N. Y. Botanical Garden.

Mentha citrina Ehrh.—Greenport in waste places; determined at N. Y. Botanical Garden.

Limosella aquatica L., var. *tenuifolia* (Wolf.) Pers.—Fishers Island, no. 743. September 15, 1891. Rev. J. L. Zabriskie.

Jasione montana L.—Sandy fields and roadsides at Laurel, August 17, 1923; determined at Bureau of Plant Industry.

Artemisia Absinthium L.—Roadsides and waste places at Greenport; determined at N. Y. Botanical Garden.

Coreopsis rosea Nutt.—Sandy swamp at Laurel, August 16, 1923.

Eupatorium album L.—Sandy fields at Laurel; determined at Bureau of Plant Industry.

Heliopsis helianthoides (L.) Sweet—Rich open woods at Mattituck, July 3, 1923. The plants not quite typical, some of the plants having leaves little rougher than usual.

Lactuca canadensis L., var. *montana* Britton—Cutchogue and Orient. Reported in the Second Supplementary list as *Lactuca canadensis*, var. *integrifolia* (Bigel.) Gray; which included *Lactuca canadensis*, var. *montana* Britton and *Lactuca sagittifolia* Ell. of the Preliminary list. A revised description of this variety is given by Dr. H. D. House, in N. Y. State Mus. Bull. **243–244:** 58. Issued May 15, 1923. "Leaves thin, acuminate, pale beneath, tapering to a sessile sagittate-clasping base, the lower ones sparingly sinuate-toothed toward the base, the upper ones all entire; stem glabrous and glaucous; achenes black, oval, flattened, one-nerved on each face, finely pitted and transversely wrinkled, the beak about equal to the body of the achene in length; pappus white; flowers apparently yellow.

"This is doubtless the plant reported by Burnham and Latham (Torreya **14:** 252. 1914) as *L. sagittifolia* Ell., which is not uncommon in southern New York. The plants here described were collected by Roy Latham, at Cutchogue, town of Southold, and presented to the state herbarium."

Xanthium italicum Mor.—Locally common in cultivated and waste grounds at Greenport; determined at N. Y. Botanical Garden.

This supplementary list brings the total number of species reported by the authors from the town of Southold to:—Insect Galls, 95; Slime-molds, 20; Algae, 102; Fungi, 928; Lichens, 127; Hepatics, 32; Mosses, 111; Ferns, 37; Flowering Plants, 1160.

BOOK REVIEW

Linnaeus*

The present volume, the most complete life of the "Father of Modern Botany" in English, represents the efforts of two men admirably fitted for the work. The late Professor Fries was professor of botany at Upsala, had control of the old botanic garden with Linnaeus' house, and was the first administrator of the home at Hammerby after it became the property of the state. He had access to all the university records of the years when Linnaeus was a student and professor as well as to all the correspondence and collections. In addition he had been an admirer of his great predecessor since childhood. Dr. Jackson who has adapted and translated the life is the general secretary of the Linnean Society of London and has written numerous articles on Linneaus and his herbarium.

The reader follows the life of the child who was quieted with a flower when fretful, through the boyhood days and away to college, travels with him through Lapland and goes down to Holland to share in the recognition and honor given the young botanist. Later he returns with him to Sweden and watches him in his university and home life. The descriptions are complete and make the reader feel the charm of the man. Following the story of the life of Linnaeus come chapters on his authorship and correspondence, the benefactors and friends, his family relations, his scientific importance. The book is considerably condensed from the two volumes by Fries and some new material has been added. Some stories long current, such as the quarrel with Rosen, have been investigated and shown to be largely fables with a slight basis of fact. Regarding the statement that Linnaeus named stately and beautiful plants after his friends, insignificant and ugly ones after his enemies, it is remarked that Linnaeus considered no plants insignificant or ugly. It is interesting after reading of how many men, professors in the University, eminent botanists of the time, or great merchants with a love of plants helped the young student and gave him opportunity for study and for collecting to see

* Benjamin Dayton Jackson, Linnaeus, The Story of his Life, Adapted from the Swedish of Theodore Magnus Fries, pp. 1-xv, 1-416. H. F. & G. Wetherby, London, 1923. Price 25s.

how he in turn helped the young men who came to him when he became a teacher. How he took them into his home, raised funds for their support or to enable them to travel, how above all else he inspired them with a love of all phases of nature. From first to last the impression is made of the vigor of the man and the amount of detailed work he accomplished.

While the book is in general well written it is marred in places by crudity of expression, apparently literal translations from the Swedish. It would have helped in following the travels on the map if the names in the text and on the map had been spelled alike. There are reproductions of paintings of Linnaeus at different periods and of the homes he occupied. The book gives many facts never before published in English, is as complete as a biography can well be, but is especially valuable because of the way in which Linnaeus is made to live for the reader.

G. T. Hastings

PROCEEDINGS OF THE CLUB

Meeting of November 14, 1923

This meeting was held at the American Museum of Natural History. The program of the evening consisted of a lecture by Mr. Carl Bannwart on "Great Men and their Attitude toward Trees," which was copiously illustrated by beautiful lantern-slides and was accompanied by many quotations from ancient and modern literature.

Marshall A. Howe,
Secretary

Meeting of November 28, 1923

The meeting of November 28 was held at the Museum of The N. Y. Botanical Garden.

Miss Helen M. Carr, Mt. Vernon, N. Y., was elected to membership.

The first paper on the scientific program was on "Viability of Date Pollen" by Dr. A. B. Stout. The date palm is dioecious and the practice of growing only a few of the staminate trees and making artificial pollinations has been in vogue for many centuries. For use in pollination the Arabs often keep the pollen for one or more years, sometimes it is alleged, for as much as

fifteen years, and the practice of thus keeping the pollen from one year to another has been adopted by some of the date-growers in southern California and Arizona. During a recent residence in California, Dr. Stout found that in nutrient media freshly gathered pollen germinated very freely but could secure no germinations with samples of one-year-old pollen. Pollen collected in February showed some germinations as late as April 28. Dr. Stout's paper will be published in the Journal of The New York Botanical Garden.

The second paper of the program was by Dr. H. A. Gleason on "A Virgin Hardwood Forest in Northern Michigan." Dr. Gleason gave a general account of the composition of the beech-maple forest of that region. Besides beech and sugar maple, the forest also has a small proportion of hemlock, yellow birch, basswood, and elm. The ground vegetation, which must be adapted to life in the dim light prevailing beneath the dense forest canopy, consists chiefly of seedlings of these trees, with a hundred or more herbaceous plants and shrubs. A detailed account of the structure of this forest association will be published elsewhere.

Mrs. N. L. Britton exhibited a remarkable fasciated stem of *Ailanthus* and some leaves of the laurel, *Kalmia latifolia*, brought in by Mrs. George C. Wheeler from a northwestern part of Manhattan Island, where the shrub apparently still persists in a natural state.

Dr. A. L. Gundersen spoke of noting on young *Phellodendron* trees in the Brooklyn Botanic Garden leaves in alternate whorls of three instead of the usual opposite arrangement.

MARSHALL A. HOWE,
Secretary

MEETING OF DECEMBER 11, 1923

The meeting of the above date was held at the American Museum of Natural History.

The program consisted of an address by Mr. Norman Taylor on "The Vegetation of Montauk," with lantern slide illustrations. An abstract furnished by the speaker follows:

The lecture dealt, in not much more than outline, with the region covered by the lecturer's paper which has been published

as the first part of volume two of the Memoirs of the Brooklyn Botanic Garden.

After an account of the early condition of the vegetation, as revealed by the agreements between the Indians and the first English settlers at Easthampton, considerable mention was made of the treeless condition of the peninsula, its grasslands, soils, and peculiar kettlehole topography.

The wind which blows at greater velocities and with greater annual movement at Montauk than at any other point on the Atlantic coast, was considered as the chief limiting factor, and some account of atmometer readings on exposed and sheltered parts of the area was given. It was shown that where trees do persist they do not capture grassland to windward, but nearly always do to leeward, where their growth in diameter is nearly twice as rapid as in exposed situations.

Actual transpiration figures are lacking, but it was suggested that further work on this point will be undertaken, with a view to the growing of selected plants in sealed containers, and getting hourly figures of water loss, together with instrumental records of the atmosphere, in all stages of the wind's velocity. This chiefly for the reason that such data are lacking, except for the experiments of Briggs and Shantz whose work was carried out under comparatively easy wind conditions, and for those of Leonard Hill on seedlings in England, where artificially induced wind of low velocity was tried. With winds of forty, fifty, and even sixty miles per hour, coupled with the usual midsummer drought, the effect on transpiration is profound. There are evidences everywhere at Montauk of this wind action, but instrumental proof of it is thus far lacking.

MARSHALL A. HOWE,
Secretary

MEETING OF JANUARY 8, 1924

The meeting of the above date was held at the American Museum of Natural History.

The following were elected to membership:

Miss Anna G. Eggerdink, New York.

Mr. Fred C. Metcalfe, Asbury Park, New Jersey.

Two resignations were accepted, those of Mr. H. Nordheim and Prof. W. C. Twiss, both now removed to California.

The program of the evening was the usual one of the annual business meeting, consisting chiefly of reports of officers for the past year and election of officers for the ensuing year.

The Secretary, Dr. M. A. Howe, reported that fifteen regular meetings of the Club had been held during the year with a total attendance of 338, an average of about 22.5 persons per meeting. 19 new members were elected in 1923; 8 members were lost, six by resignation and two by death. The present membership appears to be 293.

The Treasurer, Miss Mary L. Mann, reported gross receipts of $4301.91, including a balance of $379.45 brought over from 1922. Disbursements amounted to $3359.38, leaving a cash balance of $942.53, to which may be added undrawn interest amounting to $154.36.

The endowment funds total $3536.58, as at the end of the preceding year.

The Editor, Prof. A. W. Evans, reported that vol. 50 of the Bulletin contains 406 pages, exclusive of volume index, and 20 plates.

The Editor of Torreya, Mr. George T. Hastings, reported the publication of six bimonthly numbers, aggregating 114 pages.

The Rev. Dr. H. M. Denslow, Honorary Custodian of the Local Herbarium of The N. Y. Botanical Garden, stated that accessions aggregating about 2,000 sheets of specimens had been received during the year. These and others are being arranged geographically by counties and alphabetically.

The chairman of the Field Committee, Mr. A. T. Beals, reported that 35 field meetings were held, with attendances ranging from 57 to 2, and averaging 12. Among the plants of unusual interest collected on these expeditions were two orchids, *Malaxis unifolia* in the Catskills near Meads and *Ophrys cordata* at Bushkill, Pa.

The officers elected for the ensuing year are given on the inside front cover of this issue.

Votes of thanks for services rendered were extended to the retiring Editor, Dr. Evans, and to the retiring Secretary, Dr. Howe.

MARSHALL A. HOWE,
Secretary

The Torrey Botanical Club

Contributors of accepted articles and reviews who wish six gratuitous copies of the number of TORREYA in which their papers appear, will kindly notify the editor when returning proof.

Reprints should be ordered, when galley proof is returned to the editor. The Intelligencer Printing Co., Lancaster, Pa., have furnished the following rates:

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75 "	1.95	3.35	4.85	5.65	7.60	8.75	10.45	11.25	15.65	19.95
100 "	2.25	3.80	5.35	6.35	8.25	9.80	11.55	12.45	17.55	22.05
150 "	2.70	4.60	6.50	7.60	10.20	12.10	14.20	15.20	21.35	26.80
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EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

John Torrey, 1796-1873

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# TORREYA

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May-June, 1924

THE MAN-OF-THE-EARTH OR WILD POTATO VINE

OLIVER PERRY MEDSGER

I wonder how many botanists have dug out a root or tried to dig out a plant of the Man-of-the-Earth or Wild Potato Vine, *Ipomoea pandurata*. This vine belongs to the same genus as the Morning-glory and Sweet Potato, and is often quite common in old fields and along roadsides. It prefers a light, sandy, or gravelly soil, and ranges from Connecticut to Ontario and Michigan, on South to Florida and Texas.

This vine is rather stout and smooth, from four to ten feet long, with heart-shaped or sometimes halbert or fiddle-shaped leaves, and large, white funnel-formed flowers with a deep purple eye.

A few years ago, I undertook to dig out a root of this plant. A fine large vine was selected, but the root went so deep and the ground was so hard and dry that after an hour's work, the task was given up.

A year or two later, after a season of rainy weather, I again attempted to satisfy my curiosity and this time with better success. A good healthy plant was selected, with vines not more than six or seven feet long and in a situation where digging would be easy. From the surface of the earth, two root-like stems extended almost vertically into the ground for about a foot and then suddenly enlarged into a great fleshy root. The herbaceous vine dies each autumn, but the root remains in the ground year after year, the greater part of it being below the frost-line. In the early summer when the effect of the warm rays of the sun reaches this reservoir of food, a stem is quickly pushed up through the soil and the plant spreads its leaves and flowers to the light.

After digging for two hours or longer, I had a conical hole five feet in diameter and at least three feet deep, but the end of the

root was not yet reached. I took hold of it to see if it would loosen from the ground and the end broke off, as the illustration shows, leaving a small part of the root in the ground. The part shown in the photograph was about two and one-half feet long and weighed fifteen pounds.

The Bush Morning-glory, *Ipomoea leptophylla*, which grows on the plains just east of the Rocky Mountains from Nebraska to Texas, is said to have even a larger root, and that of *Ipomoea Jalapa*, a species of the South Atlantic and Gulf Coast, is reported to frequently reach a weight of from forty to fifty pounds.

Like the Sweet Potato, the roots of the Man-of-the-Earth are brittle and slightly milky when fresh, but unlike the former plant, there is only one root to the vine. I once saw an old orchard where the plants were numerous. The hogs running in the orchard learned that the great fleshy roots were sweet and edible. In order to get them, the hogs rooted large funnel-shaped holes often three feet deep. They fairly stood on their heads to get at the bottom of the roots. The Indians named this plant the Mecha-meck and without doubt it was a favorite food among them. They could easily roast the fleshy roots in the ashes of their camp-fires.

Last September, I found many plants of this species in a vacant lot at Arlington, New Jersey. They grew among bushes, which they used as supports and became rather vigorous climbers, sometimes nearly covering shrubs five or six feet high. I dug out one of the roots. It weighed only a few pounds, but went more than three feet deep. Next season I want to try the edible qualities of the roots.

The large white blossoms of this plant remain open through most of the forenoon and in cloudy weather, they often do not wilt until late in the day. The large hawk moths come to the blossoms in the evening and at night, but during the day they are visited by several species of bees. Prof. Robertson says it depends chiefly upon two species of bees for pollination—*Eutechnia taurea* and *Xenoglossa ipomoeae*. I have also found bumble bees visiting the blossoms and a long-tongued burrowing bee known to insect men as *Emphor bombiformis*. The geographical range of this plant is probably much wider than that of most of the insects that visit the blossoms, therefore the insects that seek the flowers in Texas would probably not be the same species as those that come to it in Southern New England.

I am convinced that plants of the Man-of-the-Earth get very old. On my father's farm in Southwestern Pennsylvania, a few plants grew in a field (the root shown above was from that group). For eighty years, the land was cultivated, alternating in corn, oats, wheat, and grass. When in sod, which was for only two or three years at a time, the plants would grow and bloom, but were not often seen when the cultivated crops were growing. The number of plants did not seem to increase or decrease as the years went by. Another plant grew on a bank by the roadside where year after year it came up and bloomed. It was there when I was a boy, and apparently the same plant, for there was but one, decorated the roadside the last time I went by the place. I would not be surprised if plants of this species sometimes live and bloom for half a century.

Explanation of plate III

Blossoms of Wild Potato Vine, *Ipomoea pandurata*. Photograph by O. P. Medsger.

Root of Wild Potato Vine (resembles a petrified dog). Photograph by O. P. Medsger.

LINCOLN HIGH SCHOOL,
JERSEY CITY, NEW JERSEY.

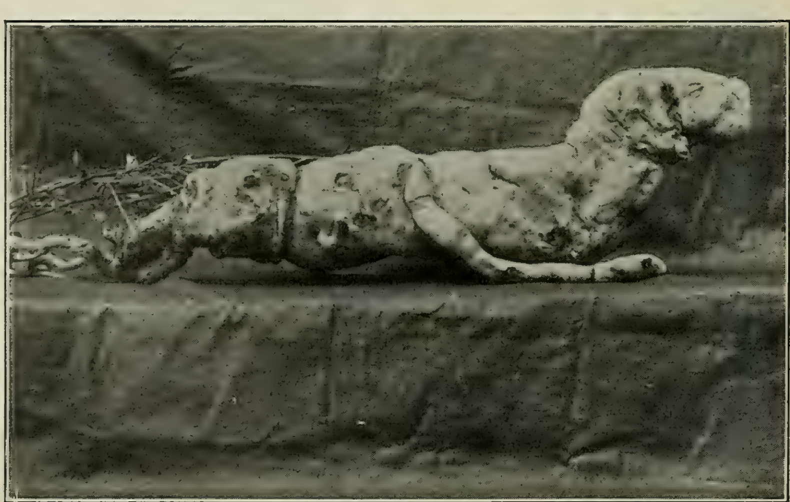
ALPINE PLANTS OF KASHMIR*

RALPH R. STEWART

Kashmir is an Indian State in the North West Himalayas. It is all mountainous with the exception of the famous Vale of Kashmir, at an elevation of 5,500 feet, which may now be reached by a good motor road from Rawalpindi in the Punjab. During the past twelve years I have spent parts of seven summers collecting in Kashmir and am now working over the material in The New York Botanical Garden.

The same four main zones that Rydberg found in the Rocky Mountains are to be found in Kashmir. The foothill zone is arid and the commonest tree is *Pinus longifolia*. In the lowest foothills there is a thorny scrub jungle with such trees as Acacia, Bauhinia and Pistachia and at the upper limit of the zone oaks are very common.

* Abstract of a talk before the Torrey Botanical Club, January 30, 1924.



In the second or montane zone, *Pinus excelsa* is most common and in this region, especially in the deeper and better soils there are many deciduous hard woods such as Acer, Fraxinus, Rhus, Juglans, Pyrus Prunus, Celtis, Ulmus and Salix. This zone extends roughly from 6,000 to 9,000 feet. The most valuable tree is *Cedrus deodara*, closely related to the Cedar of Lebanon.

The sub-alpine zone extends to about 12,000 feet and the most abundant tree is the Himalayan fir, *Abies Pindrow*. Associated with the fir and replacing it toward the tree line is the white birch, *Betula utilis*. The three Kashmir rhododendrons, the alpine junipers and willows are found near and above the birches.

It is hard to give figures for the altitude of the alpine zone. In sheltered places the snow lies longer at 9,000 than it does at 12,000 feet elsewhere and so alpine plants are commonly found from 9,000 feet to the line of permanent snow which is between 14,000 and 15,000 feet on the Indian side of the Himalayas, and much higher on the Tibetan side.

I have been specially interested in the alpine and sub-alpine zones about the camping ground of Sonamarg in the Scinde Valley. The camping site is at 9,000 feet and the mountains are from 14,000 to 15,000 feet. There are a number of small glaciers and there is a good deal of permanent snow.

Within five or six miles of camp I have gathered over 550 plants including ferns and flowering plants. The commonest orders and genera are familiar to botanists in the north temperate zone. The following have the most species:

Ferns	28	Grasses	36
Sedges and Juncus	23	Buttercups	28
Crucifers	18	Caryophyllaceae	22
Peas	22	Rosaceae	35
Sedums, Saxifrages	17	Umbelliferae	19
Compositae	63	Primulas	13
Gentians	13	Borages	10
Scrophulariaceae	20	Labiatae	23
Polygonaceae	16	Conifers	7
Orchids	9	Liliaceae	13

The following genera are the commonest and have ten or more species in the area under review: Carex, Potentilla and Poly-

gonum. The following have five or more species: Asplenium, Poa, Juncus, Anemone, Corydalis, Viola, Stellaria, Astragalus, Cotoneaster, Saxifraga, Sedum, Lonicera, Valeriana, Artemisia, Senecio, Saussurea, Primula, Androsace, Gentiana, Veronica, Pedicularis, Nepeta, Salix and Allium.

One of the most interesting plants is *Arceuthobium minutissimum*, a tiny parasite belonging to the Loranthaceae which is able to kill pine trees. The most striking flower is the blue poppy, a Meconopsis. *Megacarpea polyandra* is a curious crucifer with many stamens. The edelweiss, *Leontopodium alpinum*, is abundant. *Primula reptans* is so small that the flower is taller than the whole plant and is much larger than the leaves.

A number of our common introduced American weeds are apparently indigenous, including mullein, yarrow, Capsella, Poa sp., *Dactylis glomerata*, fireweed, *Galium aparine*, Galinsoga, Plantago sp., Brunella and Leonurus.

New York City.

A FOSSIL CELTIS FROM COLOMBIA

Edward W. Berry

I am indebted to Dr. W. P. Woodring for the characteristic fossil fruit of an Eocene species of Celtis which is described in the following note. The specimen is of especial interest, not only because it represents the first fossil species of this genus, which is so abundant in the existing flora of South America, that has been found on that continent, but also because, unlike so many similar plant fossils that have come into my hands from South America, the geological age of the material is definitely known. I owe the specimen to the courtesy of the Tropical Oil Company.

The specimen upon which the present species is based was collected by A. Iddings and R. L. Beckelhymer on the east side of a hill one mile west of Pijaquay, on the trail passing directly over the hill to Don Gabriel, in the Department of Bolivar, Colombia. It came from marine fossiliferous deposits determined by Dr. Woodring, to be of middle Eocene age, that is, about the same age as the Claiborne group of our Gulf Coastal Plain, the Green River formation of the western Interior (Wy-

oming), and the Lutetian or Auversian stages of the standard European Eocene section.

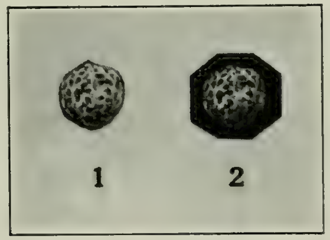
The present species can be exactly matched by the fruits of several existing species of this large genus, but its great age is undoubted proof that it represents a distinct and extinct botanical species, and it is therefore described as such. It may be called *Celtis bolivarensis* in allusion to the Department of Colombia where these Eocene deposits occur, which name in turn commemorates the great South American liberator.

CELTIS BOLIVARENSIS Berry, n. sp.

Figs. 1, 2

The species may be somewhat incompletely characterized as follows:

Stone of a drupaceous fruit, of relatively small size, nearly spherical in form, shortly acuminate tipped distad. Polar diameter slightly longer than the equatorial diameter. Dimensions: Length 5.5 mm., equatorial diameter 4 mm. in one direction and 5 mm. at right angles to the minimum diameter, the difference being probably due to a slight amount of deformation during or subsequent to fossilization. There are four equally spaced smooth and slightly angular longitudinal areas dividing the stone into quadrants, and uniting to form the acuminate tip and the slight prominence at the chalazal pole. The surface of each quadrant is conspicuously pitted, though scarcely meriting the term rugose, by about twenty well distributed rounded depressions or pits. These vary somewhat in size and outline, and are separated by rounded ridges, which, however, do not project above the general surface of the stone.



Celtis bolivarensis Berry, n. sp. × 2 from the middle Eocene of Colombia.

It may well be doubted if, in most cases, species of Celtis can be distinguished by means of the characters of the stones. This can be done in the case of some of the existing species, but is impossible in the case of others. The present species of Celtis is associated with a leguminous seed which it has not yet been possible to identify.

The genus Celtis is a most interesting member of the family Ulmaceae, in fact the whole family bristles with problems of distribution and geologic history, and none of the genera surpass Celtis in this respect. As currently understood Celtis includes about eighteen fossil species ranging in age from Eocene to Pleistocene. The Eocene species are four in number and all are American. The Oligocene species are also four in number and are North American and south European. The rather numerous Miocene species are found in Europe and in North and South America. The Pliocene species are European and Asiatic. The Pleistocene species known to date are all North American and represent the section Euceltis of Planchon.

The living species of Celtis number about 90 and are widely distributed and usually divided into four sections or sub-genera, namely: Euceltis, Sponioceltis, Solenostigma, and Momisia, which are sometimes considered and are probably entitled to generic rank. The present fossil species belongs to the sub-genus Momisia of Dumortier, which has about 25 existing species ranging from Texas to the Argentine, and with the genera Ampelocera, Trema, being especially characteristic of the warmer parts of South America. Momisia appears to have invaded the southern United States from equatorial America along with the fossil flora that characterizes the middle and upper Eocene in that region.

In view of the impossibility of making fine discriminations from the fruits alone, the present fossil species is referred to Celtis, using that term in the wider sense. The majority of the existing species are mesophytic types of humid regions, but several of the forms, notably *Celtis occidentalis* Linn., in our western states, and *Celtis tala* in the northern Argentine, survive very adverse conditions and aridity.

Johns Hopkins University,
Baltimore, Md.

FUNGI AT WOODSTOCK, NEW YORK

W. A. Murrill

Dr. John A. Kingsbury, formerly Commissioner of Charities of New York, invited me to spend Labor Day with him and his family at their summer home in Woodstock, where so many artists live and where the woods are just now beginning to show their annual crop of mushrooms.

Leaving the train at Rhinecliff and crossing by ferry to Kingston, I found Dr. Kingsbury waiting for me with his car shortly after ten o'clock Sunday night, and we drove to Woodstock in about forty minutes. Monday was a very full day for mushroom enthusiasts and other nature-lovers. A number of us explored the woods in a body and found over a hundred species, most of them fleshy and harmless. The Kingsbury children are exceedingly expert and it was delightful to hear their innocent tongues twisting so sweetly and confidently about such jaw-breaking names as "*Polyporus sulphureus*," "*Hydnum repandum*," "*Hypholoma perplexum*," "*Amanita phalloides*," "*Clitocybe illudens*," "*Fistulina hepatica*," and many others with which they were perfectly familiar.

The display of these specimens on tables in a huge room, set off with backgrounds of mosses and ferns was left to the artists, who did their part remarkably well. Dinner was served to about forty people in this same room, and was followed by an address by me on edible and poisonous mushrooms, illustrated with the freshly gathered specimens. A few general remarks were first made on the subject of fungi and references made to the chestnut canker, apple rust, black knot of plum, blister rust of white pine, wheat rust, oat smut, etc.

The principal edible and poisonous groups of fungi were then discussed and suggestions made as to how to distinguish them. Attention was called particularly to the two most deadly species, *Amanita phalloides*, or the "destroying angel," and *Amanita muscaria*, the "fly agaric," which are accountable for most of the fatalities connected with mushroom eating. The puffballs, coral-fungi, and certain other groups were shown to be entirely harmless, easily recognizable, and valuable additions to our menu.

It happened that four giant puffballs were growing at the time in Dr. Kingsburys' yard, a few feet from where we were gathered.

These were examined with great care and interest and their history detailed to us by Dr. Kingsbury, who had cut off sundry slices from their expansive tops. At the close of the address, Dr. Kingsbury also staged a very effective dénouement by turning out all the artificial lights and allowing several clusters of *Clitocybe illudens* suspended above us to shine forth in their weird, ghost-like glory. This brilliant orange fungus has the power of phosphorescence and I have succeeded in reading a newspaper with the help of its light.

On Tuesday, I drove with Dr. Kingsbury and his family about fifty miles westward to Yama Farms, where we had luncheon and spent some time hunting for fungi about Jenny Brook, where the trout are bred. Here we found a number of additional interesting forms to add to those already secured at Woodstock, among them a beautiful yellow Amanita named in honor of Charles Frost, the shoemaker botanist. We also found a "fairy ring" thirty feet in diameter containing scores of gemmed puff-balls of unusual size. In the Middle West, the giant puffball sometimes grows in giant "fairy rings"!

NEW YORK BOTANICAL GARDEN,
NEW YORK CITY.

SHORTER ARTICLES

ONOBRYCHIS ONOBRYCHIS (L.) RYDB. IN THE EASTERN UNITED STATES.—This Eurasian plant was collected at Fort Howard, Wisconsin, as early as June 15, 1882. How it was introduced there seems not to have been recorded. In the meantime it became an important fodder-plant in the Rocky Mountain region. Its widespread use as a fodder plant resulted in its prompt naturalization in the vicinity where it was cultivated. Thus it was scattered through the Rocky Mountain States, and it has been found in British Columbia. Within the past decade it has been found along railroads in Missouri. More recently wild plants have been collected in New York. Specimens came to The New York Botanical Garden last year from Dr. Anna E. Perkins with a note to the effect that they were gathered in Gowanda, New York, June 1st, 1922. The colony was first discovered by Dorothy Raymond, a school girl of Gowanda in 1919. The plants originated from the seeds brought to Gowanda in imported hides.

Its popular names are Sanfoin, cock's-head, hen's-bill. Other botanical names by which this plant is sometimes known are *Onobrychis viciaefolia* and *O. sativa* Lam.

John K. Small.

Ophioglossum hastatiforme Ckl., not an Ophioglossum

It is with sincere regret that I am constrained to call attention to a note in the January-February number of Torreya by my friend Professor Cockerell entitled "A Genuine Fossil Ophioglossum,"* and to point out that the fossil in question is not only not an Ophioglossum but not even a new species of fern.

My especial interest in the question comes about in the following manner: Mr. N. H. Brown of Landor, Wyoming, has been coöperating with me for the past two years in collecting fossil plants from the Wind River Basin in that state. Last summer he discovered two specimens of this alleged Ophioglossum, and, under the impression that they were insect remains he forwarded them to a friend in Colorado, from whom they reached the hands of Professor Cockerell, and the cited paper in Torreya was the result.

When Mr. Brown learned this he was stimulated to renewed search at the Tipperary locality, and a few weeks ago he sent me about a dozen specimens of this plant, some of which are in an excellent state of preservation. The supposed Ophioglossum is none other than *Danaea coloradensis* Knowlton,† the type of which came from the Green River oil shale, about 40 miles southwest of Meeker, Colorado.

The described spike is not a spike, nor is it hastate in form, and the sporangia are clearly synangia, as their form should have suggested. I have compared the Wind River specimens with Knowlton's type from the Green River, and both he and I agree that the two occurrences represent the same species, and that it is not an Ophioglossum, and this is corroborated by Mr. W. R. Maxon, our well-known authority on ferns, who most emphatically supports its reference to the genus Danaea.

* Cockerell, T. D. A., Torreya, **24:** 10–11. 1924.

† Knowlton, F. H., U. S. Geol. Survey Prof. Paper **131:** 150, pl. 36, fig. 4, 1923.

The Wind River specimens of *Danaea coloradensis* in my hands are more numerous and better preserved than either Knowlton's type, or the material in the Museum of the University of Colorado, and will be fully described in an account of the associated flora of about 35 species upon which I have been working for some time.

The beds are stratigraphically above the true Wind River formation and are middle Eocene in age, being obviously the same age as the Green River flora. Whether, with their differing lithology they should be called Green River or referred to the Bridger has not yet been decided.

Edward W. Berry.

Trilisa on the Market

I am sure it will be of interest to most botanists as it was to the writer to learn that rather large quantities of the basal leaves of *Trilisa* are gathered, dried, and sold for incorporation into smoking tobaccos. In the section of Georgia where I learned about the matter the plant is called deer-tongue, and I am informed by Mr. R. K. Hopkins, general merchant of Meridian, who certainly knows whereof he speaks, that while in some years the quantity would not exceed five or ten tons, in others very much more, possibly one hundred tons are gathered and shipped from Liberty, McIntosh, and Glynn Counties, Georgia. Whether both of the species, *paniculata* and *odoratissima* are collected, I am unable to say, but probably they are. Samples of the dried leaves obtained seemed to be the latter species. They retained their strong coumarin (vanilla) odor undiminished for the three months they were in my possession.

W. L. McAtee.

A Yellow Variation of Eustoma (Gentianaceae)

I am much indebted to Mr. E. Bethel for the loan of a sheet of *Eustoma russellianum* (Hook) Griseb., belonging to the State Museum, including specimens of a remarkable new form (**f, flaviflorum** nov.) with clear yellow flowers. This variety was found by Mrs. S. B. Walker along with ordinary blue forms from

near Denver, Colorado, in 1914. It is of more than usual interest, because the type of *Gentiana* (*Gentiana lutea* L.) has yellow flowers, and the same is true of the Asiatic *G. othophora* French, and of certain species of *Centaureum*. The yellow is evidently due to a soluble flavone. I examined a fragment of one of the petals under the microscope and it gave the characteristic light yellow reaction with potassium hydroxide. The variety or form of *E. russellianum* with white flowers (*f, albiflorum*) has long been known. The Denver plant belongs to the segregate called *E. andrewsii* A. Nels., but it seems to be the same as *E. russellianum*, as Rydberg indicates, although he wrongly credits the latter name to Linnaeus.

T. D. A. Cockerell.

Myrica Carolinensis, New to Chester County, Pennsylvania

While studying the flora of a portion of Chester County, Pennsylvania, in an ecological investigation reported elsewhere, the writer discovered a fine specimen of bayberry (*Myrica carolinensis* Mill) growing on the South Valley Hill near Paoli. The plant is staminate, almost two meters in height, and of healthy growth. No other bush of the same kind is near. The plant is growing at the edge of woods on the cleared brow of a shoulder of the hill, somewhat protected from the full sweep of winds by part of the shoulder. The soil is dry and sterile (Manor stony loam) of mediacid reaction (pH 6.2 to 6.4).

Myrica is not recorded by Darlington* in *Flora Cestrica;* Porter† records the species *M. carolinensis* from the adjoining county of Lancaster.

A branch from the plant has been placed in the herbarium of the Academy of Natural Sciences in Philadelphia.

Arthur P. Kelley.

* Darlington, W., 1837, Flora Cestrica.
† Porter, T. C., 1903, Flora of Pennsylvania.

New Combinations

In order to make the treatment of hosts uniform in the seventh volume of the North American Flora it is necessary to propose a new combination for *Euphorbia macropodoides* Rob. & Greenm. (Amer. Jour. Sci. III. **50**: 164. 1895). It is a Mexican plant, and on a collection of it made by Pringle in the mountains above Cuernavaca, August 4, 1896, has been found *Nigredo proëminens*. Collections of this Euphorbiaceous rust have previously been reported on three other species of Euphorbia under the segregate name of *Zygophyllidium*. For the sake of uniformity the present species of host is here transferred to that genus as **Zygophyllidium macropodoides** (Rob. & Greenm.) comb. nov.

In establishing the genus *Commelinantia* in the Bulletin of the Torrey Botanical Club (**49**: 269–275. 1922) Professor B. C. Tharp suggested that in addition to the type species a Mexican plant should be included. A year ago he made a trip to Monterey, Mexico, and secured herbarium material and also living plants, which have since been under observation at Austin, Texas. In a recent letter he writes: "I think there can be no doubt as to its being a valid species, which may be properly included in the genus Commelinantia." As he has sent me a rust obtained at Monterey labelled with the suggested combination, I take this opportunity to place the name on record, as follows: **Commelinantia Pringlei** (S. Wats.) Tharp comb. nov. (*Tradescantia Pringlei* S. Wats. Trans. Am. Acad. **26**: 157. 1891).

J. C. Arthur.

Purdue University,
Lafayette, Ind.

BOOK REVIEW

Pennsylvania Trees—Illick*

The fourth edition of Illick's "Trees of Pennsylvania" appeared from the press in March, 1924,* the third edition (1919) having been out of print for some time. The present edition is a book of 237 pages including 119 full-page line-drawing plates illustrative of the trees described on the pages facing them. The

* Illick, Joseph S., Pennsylvania Trees, Penn. Dept. Forestry Bull. 11, 4th edition, 1924, May, 1923, Harrisburg.

frontispiece plate shows "The Father of Pennsylvania Forestry," the late J. T. Rothrock standing beside another veteran, a magnificent old tree. Nine other plates give details of structure and form of leaves, buds, flowers, fruits, etc., while 126 half-tone figures illustrate forestry, conservation, fire destruction and fire-protection, trees, and tree-trunks. In general the typography is good and the proof-reading well done. It is unfortunate that better paper was not used for the half-tone figures; in this respect the third edition was far superior. However, as a whole, this book is without a peer as a convenient comprehensive handbook of the trees of a limited region, such as the State of Pennsylvania.

In Part I, pp. 1–57, the author has presented for the layman, the student of trees, and the beginner in forestry, an excellent little text on the general subject of trees and forestry in Pennsylvania. In this part of the book considerable improvement has been effected over the third edition. There has been added, pp. 17–20, a discussion of "Forest Types in Pennsylvania," in which it is stated that the following nine major forest types may be found in the State: Spruce-Fir (Northern Swamp type); Beech–Birch–Maple (Mixed Northern Hardwood); White Pine–Hemlock; Aspen–Fire Cherry; Chestnut–Rock Oak–Pitch Pine; Scrub Oak; Oak–Hickory; River Birch–Swamp Maple (River and Swamp Hardwood); Sweet Gum–Willow Oak. The reviewer prefers to separate the Pitch Pine type from the Chestnut–Rock Oak type. The Pitch Pine type seems to be more of a pioneer type succeeded under slightly more favorable conditions by the Chestnut–Rock Oak type.

Under "Historic Trees of Pennsylvania" an interesting account is given of the descendants of the famous Penn Treaty Elm. Other historic trees are the White Oak Witness Tree and the Lafayette Sycamore. The discussions of "When Trees Grow" and "Do Trees Grow at Night?" present the results of some of the author's original work showing that about 90% of the height growth of Pennsylvania's trees is made in less than forty days of spring and early summer and that most of this growth occurs late at night.

Part II is a Manual of Pennsylvania Trees, with keys, descriptions, and illustrations. Most of the trees treated are native, but some, such as the Scotch Pine and the Norway

Spruce, are included because of their rather extensive occurrence in forest or other plantations. Illick tabulates 186 as the number of native trees in the State, with 29 other species introduced. A number of the less common or less important species are passed over with but brief mention. Only two hawthorns (*Crataegus Crus-galli* and *C. coccinea*) are described, admittedly no attempt being made to include the various other 30 hawthorns which some botanists would claim as arborescent species in the western half of the State. For general purposes, such as Illick's "Trees of Pennsylvania" is meant to serve, it is probably best not to include more until the status of these forms of *Crataegus* is better known. The reviewer has evidence of *Pinus rigida* northwesterly up to a line from Beaver to Warren counties, approximately the line of the terminal moraine, and this is probably the northwestern range of the species in Pennsylvania. The Ohio records also seem to bear out this relation of range to the terminal glacial moraine. Approximately the same thing holds also for *Pinus virginiana*.

O. E. Jennings.

NEWS NOTES FROM THE FOREST SERVICE

Colorado Springs Maintaining a Tree Nursery for Highway Planting

The advantages of beautiful as well as well-paved highways is keenly felt by citizens of many localities, and in Colorado Springs, Colo., the local automobile club is taking a practical step toward attaining these advantages by a definite program of tree planting along the highways leading into the city. According to present plans the club will maintain a nursery of its own, buying seedling stock or tree seed, and raising the stock until it is of sufficient size to put out along the roads.

The Torrey Botanical Club

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A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

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(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

MISS MARY LEE MANN
171 Union Street,
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EDITED FOR

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BY

GEORGE T. HASTINGS

John Torrey, 1796-1873

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THE TORREY BOTANICAL CLUB

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2567 Sedgwick Ave.
New York City.

TORREYA

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July-August, 1924

SWAMP AND BOG PLANTS: *IRIS VERSICOLOR* L.

Frank C. Gates* and Elsie E. Erickson

The differentiation between bogs and swamps has been of considerable interest in the past and it can not be considered as solved at the present time. Possibly there never will be any conclusion beyond stating that swamps and bogs form ends of a linear series, intergrading freely. In his studies in bogs and swamps, the senior author has endeavored to find different plants which grow under both conditions to see whether any structural differences are discernible. One such plant is *Iris versicolor* L.

Iris versicolor is a rather common swamp plant in Northern Michigan, but it also grows in bogs, although sparingly. It is best developed in swampy places just back of the shores of lakes where protection is afforded from wind, waves, ice and sand. The plant is a perennial herb, with a thickened, somewhat branched subterranean stem growing 2.5 to 10 to 25 cm. or more below the surface of the soil and bearing a few leaves and a flowering stalk at the tips. The roots extend outwards and downwards from the rootstocks. The leaves are flat, sword-shaped, light-green, parallel-veined and smooth. They are held in a vertical position by their sheathing bases. The flowers of Iris are too well known to need description here. The fruit is a long, more or less triangular, three lobed, stout-beaked, many-seeded capsule.

The following study was made under the senior author's direction at the University of Michigan Biological Station on Douglas Lake, Cheboygan County, Michigan, during the summers of 1922 and 1923 by Miss Elsie E. Erickson. The aim was to discover, if possible, some way of telling whether a given plant of Iris had grown in a bog or in a swamp. In each of several different areas in the region, investigation was made of the growth structures of the plant, after which typical individuals were brought into the laboratory, sectioned and studied.

* A contribution from the Biological Station of the University of Michigan and from the Botanical Laboratory of Kansas State Agricultural College No. 195.

The study in the field brought out a number of points of interest, but failed to reveal any sufficiently conspicuous differences between the swamp and bog plants. The form of the rhizomes and roots seemed to be essentially identical, whether the plants were growing in sandy or loamy swamps, or in the muck of bogs. The conditions which caused death of the rhizomes, viz., too great a piling up of sand or debris above them, obtained in both cases. Within limits, the Iris rhizome can adjust itself to changes in the soil level by growing up or down. The limit in the case of encroaching sand seems to be about 20 to 25 cm. Excellent examples of this were to be seen in the spring of 1922, following the unusually heavy icework of the winter of 1921–22 at the head of Burt Lake. Approximately 8 meters of the beach was shoved in on the swampy area at the head of the lake. This covered large beds of Iris with about 45 cm. of sand and killed the plants. Decayed rhizomes were found beneath the sand where Iris had formerly been abundant.

In general the characteristics of the stems and leaves appeared to be essentially identical throughout—the modifications which occurred in the leaves being due primarily to the amount of shade the plants were receiving. As shade was more frequently met with in bogs, particularly the higher-shrub bogs, greater etiolation of the leaves was more frequently met with there. Similar conditions in swamps however produced the same results. The only feature of difference was that the leaves from bog plants averaged a trifle narrower than those from swamps (1.8 cm. in bogs, 1.9 cm. in swamps). A study of free-hand sections of the leaves failed to reveal any differentiating characters, but in the rootstock it was found that the epidermal cells of the plants growing in bogs had very much thicker walls than those growing in swamps, (19 μ in bogs, 9 μ in swamps). In bogs, fruit was much less abundantly produced and the capsules that formed were small.

In conclusion, it would appear from this study, that in the case of *Iris versicolor* L. in the Douglas Lake, Michigan region, the visible effects of the bog environment upon this swamp plant were a slight narrowing of the leaves, a very conspicuous thickening of the cell walls of the epidermis of the rhizome, and a reduction both in the amount of fruiting and in the size of the fruit.

Table of Measurements of *Iris versicolor*

Height of 205 swamp plants	111.5	(75.8)	30.0 cm.
" " 220 bog plants	126.5	(82.7)	30.6 cm.
Width of leaves of 239 swamp plants	2.7	(1.9)	0.8 cm.
" " " " 237 bog plants	3.1	(1.8)	0.7 cm.
Depth of rhizome below surface, 103 swamp plants	24.9	(10.7)	2.4 cm.
" " " " " 62 bog plants	30.4	(12.3)	3.5 cm.
Thickness of outer wall of epidermis of 70 swamp plants	11.	(9.)	8. μ
" " " " " " " 55 bog plants	21.	(19.)	17. μ

JOHANN DAVID SCHÖPFF

A Pioneer of American Botanical Exploration

Adolph Toepffer

Johann David Schöpff was born on March 8, 1752, in Wunsiedel, Bavaria. After graduating from the gymnasium at Hof, he studied medicine at the University of Erlangen, specializing in botany and zoology.

Early in 1777 he accompanied a regiment of Bavarian soldiers to America as an army physician. While connected with an army hospital in New York he was able to make some studies on the plants of the vicinity, and conceived the plan of writing a Flora of the State of New York. Recently there has come to light the incomplete manuscript, entitled "*Index Plantarum Noveboracensium, quarum virtutes medicamentosa partim jamjam exploratae, partim adhuc explorandae,*" which describes some 790 species of phanerogams, identifying them with Linnean species and with the plants described by Cadwallader Colden in 1744. He also describes briefly various cryptogams lent him by another Hessian surgeon, Dr. von Wangenheim. Among these were 18 ferns, 28 mosses, 4 hepatics, 37 algae, and 18 fungi. The plants are all arranged according to the Linnean system, the descriptions being in Latin.

Among the localities where plants were collected are the following:—Mr. Bayard's House, Bloomendale, Bokram Mill, Bowery, Brooklyn, Bunkers Hill, Bushwick, Coldspring, Coler Ferry, Cuylers Hook, Derkers Ferry, Dennys Ferry, Elliot's House, Flatbush, Flatlands, Flushing, Flushing Fly, Fort George, Fort Kuyphausen, Gravesend, Greenwich, Huntington, Jamaica, Jerico, Jerusalem, Kingsbridge, Laurel Hill, Morris

Hill, Morrisiana, New Utrecht, Philips Manor, Red Hook, Sandy Hook, Staaten Island, Mr. Stuyvesant's Lands, Turtle Bay, Valentine's Hill, West Chester, Wolferts Hollow, Yellow Hook, and York Island.

When the truce was signed in 1783 he was discharged from the army and travelled through Pennsylvania, Maryland and the Carolinas. After a two month's rest in Charleston, he continued his travels to St. Johns and St. Augustine in East Carolina and thence to the Bahamas, studying the plants and animals of these regions.

In the fall of 1784 he returned to Europe in a small ship. In Bayreuth he secured an appointment as court and military surgeon. In 1787 he published his only botanical work, the *Materia Medica Americana.* The following year he published in two volumes a description of his travels; there were included many references to the climate, geology, plants and animals and to social and political conditions in the North American Republic. In succeeding years he published several small monographs on zoological topics, the most important being the Natural History of the Turtles.

It is to be regretted that the *Index Plantarum* was never finished. Numerous notes in ink and pencil on the manuscript show that Schöpff worked over it during later years, probably intending to publish it.

MUNICH, BAVARIA.

BOOK REVIEW

LUMBER AND ITS USES*

The book describes briefly the structure of woods, illustrating the main types with photographs of microscopic sections. The physical properties of woods are given, with tables of the specific gravities, strength, elasticity, hardness, etc., of the important woods. Other chapters are devoted to lumber grades, standards of size, structural timbers, shipping, seasoning, and preserving woods. The chapter on paints and wood finishes are complete enough to enable the home builder to know what should be speci-

* Lumber and Its Uses, R. S. Kellogg, Revised by Franklin H. Smith, pp. 1–370, fig. 98, U. P. C. Book Co., New York, 1924. Price $4.00.

fied in contracts for work and to give the fundamentals of the work, but is scarcely full enough to be used as a guide by the amateur wood finisher. In the chapter on the uses of lumber, fifty-one uses, each taking over a million board feet per year are described. For each of these a table showing the percentages of the different woods used is given. For example, of the 56 million feet used in making boot and shoe findings—lasts, trees, pegs and wooden heels—maple furnishes 82%, birch, basswood and beech 17% and other woods 1%. In another chapter forty-six commercial woods are listed with the characteristics of each and the common uses. In this list the names are usually generic with the differences between species briefly given, so that the number of commercial woods is actually many more than appears at first. The botanist will find the chapters on the characters of wood, the commercial woods and the forest regions of interest, scout leaders will also find much of interest, but the real use of the book will be to those who use wood in construction, building or some form of manufacturing. The general appearance of the book, the paper used and the printing is all good. The many tables make it of value for reference. A key for the determination of the commoner commercial woods would have added to its value.

G. T. Hastings.

PROCEEDINGS OF THE CLUB

Meeting of January 30, 1924

The meeting was held at The New York Botanical Garden.

Dr. R. H. Cheney of New York was elected to membership. The resignation of Mrs. J. S. Ehrich was accepted.

Dr. Barnhart reported for the auditing committee that the treasurer's books had been examined and approved.

The program of the afternoon consisted of two interesting talks by Dr. J. K. Small and Dr. R. R. Stewart.

Dr. Small outlined a recent (December, 1923) excursion of exploration in Florida. About four thousand miles were covered in northern Florida and the peninsula. The itinerary extended from Jacksonville to the mouth of the Appalachicola River, then through the peninsula by several crossings to Cape Sable. Specimens and photographs were shown to illustrate (a) recently

naturalized species, (b) extension of geographic ranges, (c) very rare plants, such as a Torreya or Stinking Cedar (*Tumion taxifolium*), Florida-Yew (*Taxus floridana*), and Chapman-Honeysuckle (*Rhododendron Chapmanii*), (d) new species, and (e) new genera. Paintings of several species of iris were shown, the main object of the excursion having been the collection of material of this genus.

Dr. Stewart described the vegetation seen in his travels in Kashmir. An abstract of his talk was printed in the May–June issue.

Arthur H. Graves,
Secretary.

Meeting of February 12, 1924

The meeting was held at the American Museum of Natural History and in spite of the unfavorable weather was well attended.

Dr. O. E. White, of the Brooklyn Botanic Garden, who was a member of the Mulford expedition for the Biological Exploration of the Amazon Basin, addressed the club on the forests of the Amazon, his title being "The Amazonian Wilderness."

Although the Amazon was first discovered as far back as 1541, Dr. White stated that the territory through which it flows is even now mainly the domain of rubber collectors, Brazil nut gatherers, and Indians. Notwithstanding the fact that it has two large cities—Para, located near one of its many mouths, with a population of 200,000 and Manaos with about 50,000 people, located about 800 miles further up the river, near the junction of two large tributaries, the Madeira and the Negro, the population of the whole Amazon basin is only about 600,000 and most of these are concentrated in the lower reaches of the river between Manaos and Para as well as in these two cities. These figures take on added significance when we realize that this whole Amazon basin is 45 times the area of New York State and ⅔ the size of the United States. It was estimated in 1910 that only 25 square miles of this vast area were under cultivation.

Dr. White found that the real wilderness of the Amazon basin—the wildest part—lay in the triangle formed by the Andes Mountains as a base and the Negro and Madeira Rivers,

north and south branches, respectively, of the Amazon, as sides, meeting at a point near Manaos. As to the forests of the Amazon, he explained that they "are not dark and gloomy in the sense of our conifer forests—no mass effects of one type of tree or plant, but many diverse kinds in a small area, making foresting problems difficult. The trees were mostly of the hardwood type, their woods often rare and beautiful in coloring. The forests are full of 'perching,' i. e., epiphytic cacti, peppers, orchids, members of the pineapple family, and ferns, fastened to the trunks and branches and in the crotches of large trees. Floral displays in these forests are rare—only occasionally a bright daub of color from a single blooming tree or vine,—usually yellows, purples, reds and bright oranges—but the monotonous green as one drifts down the rivers on rafts or on steamers becomes very tiresome—one becomes 'green-tired.'"

"Many strange wild fruits and drugs are found in this region; in the upper Amazon basin chocolate or cacao grows wild with its pumpkin-colored pods and purple seeds. The orchid, vanilla, with yellow flowers and scented pods, clambers over and up the trees in many places. The common vanilla substitute is also there—the tonka bean tree.

Besides the harvesting of Brazil nuts, another industry is the collection of wild rubber; and although this now represents only a small per cent of the world's supply—the great bulk at present coming from the plantations of the Dutch East Indies and the Federated Malay States—yet it still holds the highest rank for quality. Two kinds of rubber are common: the Hevea or Para rubber, known as 'goma' and Castilloa or 'caucho'—the latter only half as valuable as the former. The Hevea tree is tapped from year to year, but in the case of Castilloa, the whole tree is cut down."

Among other interesting plants described by Dr. White were the Balsa tree, famous for its light wood, the Annotto tree, whose fruit yields the dye used commonly to color our butter, and the Brazil nut tree, whose nuts form such an important article of commerce.

Dr. White found that the main feature of the climate was its everlasting sameness—during the rainy season, continual rains day after day—and during the dry season, perpetual sunshine;

and this monotony becomes tiresome, productive of ennui and loss of energy.

ARTHUR H. GRAVES,
Secretary.

MEETING OF FEBRUARY 27, 1924

The meeting was held in the lecture room of the Museum of the New York Botanical Garden.

The following were elected to membership: Mrs. Frances L. Muller, New York City; Miss M. Georgina Biddle, New York City; Professor M. A. Chrysler, Rutgers College, New Brunswick, N. J.; Miss Mary A. Clark, Brooklyn.

The following resignations were accepted: Mrs. and Miss Langmuir, Mr. George T. Harrington, Mrs. Arthur L. Sproul, Professor H. F. A. Meier, Dr. Carl A. Schwarze, and Mr. W. T. Arnold.

Dr. C. E. Allen, of the University of Wisconsin, who is taking Dr. Harper's place at Columbia during the latter's absence in Washington, D. C., gave a talk illustrated with lantern slides on "Some variant characters of a liverwort (Sphaerocarpus) and their inheritance." Dr. Allen said that *Sphaerocarpus Donnellii*, like other species of the genus, so far as known, is strictly dioecious. The four spores formed by the division of a single spore mother cell remain adherent at maturity, at least under greenhouse conditions, with the exception of those produced by one clone. When the four adherent spores germinate, two develop into male gametophytes, two into female. Male and female gametophytes are characterized by the possession of different chromosome groups; one of the chromosomes of the female (the X-chromosome) is very large; the corresponding one in the male (the Y-chromosome) is very small. Both are present in the sporophyte and separated in the reduction divisions, so that, of the four spores formed from a spore mother cell, two receive the X-chromosome and can develop only into female plants; the other two receive the Y-chromosome and can develop only into male plants.

Races have been isolated which differ in several vegetative characters. The "tufted" character shows itself especially in the very variable form of the involucres. If a tufted female is

mated with a typical male, four classes appear among the gametophytic offspring; tufted females, typical females, tufted males, and typical males. Apparently the tufted offspring are more numerous than the typical offspring.

The "polycladous" character, first found in a male race, is marked by a profuse and irregular branching, the reduction or absence of involucres, and the presence of few antherids. The mating of a polycladous male with a typical female results in four approximately equal classes of gametophytic offspring. The polycladous females have thus far proved entirely sterile.

The sporophytes borne by the female plants of one clone produce spores that are separate at maturity instead of adherent in tetrads. The spore-separation character is inherited only through the female offspring of this clone, the transmission of this character following, therefore, the same course as that of the X-chromosome.

A semi-sterile male race has been isolated, resembling typical races except in the small proportion of antherids and involucres produced. Races of both sexes have also been found which differ in the proportion of appendages borne upon their involucres. The inheritance of these latter characters has not yet been studied.

Arthur H. Graves,
Secretary.

Meeting of March 11, 1924

This meeting was held at the Museum of Natural History. Professor Jean Massart of the University of Brussels gave an interesting address, illustrated with lantern slides, on the "Internal Sensations of the Norfolk Island Pine (*Araucaria excelsa*)." Professor Massart pointed out that as regards the position and potentialities there are 6 kinds of buds on the stems of *Araucaria excelsa:* the active terminal bud of the main stem; the dormant lateral buds of the main stem; the active terminal bud of the primary branch; the dormant lateral buds of the primary branch; the active terminal bud of the secondary branch, and the dormant lateral buds of the secondary branch.

That there is an internal correlation of some sort existing between these different classes of buds is shown by experi-

mental work. For example, if the top of the main stem is removed, the dormant lateral buds immediately below the cut develop to replace the normal head, and of the new shoots from these, one develops more rapidly than the others, inhibiting their growth. Girdling experiments bring similar results, and grafting a secondary branch in the place of the main shoot reveals the fact that its nature cannot be thus changed to that of a main shoot.

Arthur H. Graves,
Secretary.

Meeting of March 26, 1924

The meeting of this date was held at the New York Botanical Garden.

The following were elected to membership: Mr. B. R. Abbott, New York City; Dr. William Crocker, Boyce-Thompson Institute for Plant Research, Yonkers, N. Y.; Miss Eunice Rogers, New York City, Mr. S. Fred Wright, Orange, N. J.

Three resignations were accepted: Mr. C. M. Shipman, Willoughby, Ohio; Mr. James A. Crawford; Miss Margaret Chapin, Brooklyn.

The Secretary read a communication addressed to the Club from Mr. W. G. Waterman, Chairman for Local Organizations of the Committee of the Ecological Society of America on the Preservation of Natural Conditions. The letter urged the cooperation of the Club in a movement looking toward the withdrawal of the region surrounding Glacier Bay from entry, and the making of a national monument of the same for the purpose of preserving intact for science the glaciers and the surrounding region. It was suggested in this letter that the Secretary of the Club be authorized to write letters to Hon. Hubert C. Work, Secretary of the Interior, Washington, D. C., and to Mr. Stephen Mather, Director of the National Park Service, Washington, in furtherance of this movement.

On a motion of Dr. Howe, which was seconded by Dr. Rydberg, with the approval of the Club, the Secretary was so empowered.

The scientific program of the meeting consisted of two talks. The subject of the first, by Margaret A. Graham of Hunter College, was "Fertilization in the Liverworts with Special

Reference to *Preissia quadrata.*" For both this and the following paper microscopic slides demonstrating the various stages were placed on view.

Miss Graham reviewed the work on fertilization in the liverworts, as follows:

In 1891, Kruch observed that the antherozoids of *Riella Clausonia* enlarge at once upon entering the cytoplasm of the egg and that the body of the male pronucleus divides into eight chromosomes. The two pronuclei become almost equal in size when in contact.

Rickett (1923) observed that both the male and female pronuclei in *Sphaerocarpus* form chromosomes and that the nuclear membrane of each breaks down.

Humphrey (1906) observed the antherozoid when still a curved rod, lying in contact with the egg nucleus of *Fossombronia longiseta.*

In *Ricciacarpus natans*, Garber (1904) observed that the male pronucleus was half the size of the female pronucleus and that they were in contact.

In *Riccia Frostii*, Miss Black (1913) observed the male pronucleus in the egg cytoplasm near the female pronucleus.

Woodburn (1914) observed the two pronuclei in the cytoplasm of *Reboulia hemispherica*, Sharpe (1921) made a similar observation for *Anthoceros* and Mayer (1911) for *Corsinia Marchantoides.*

In *Preissia quadrata*, Miss Graham observed that the antherozoid enlarges at once upon entering the cytoplasm of the egg and moves near to but not in contact with the female pronucleus. At this time a centrosphere may be observed in the egg cytoplasm near the antherozoid. While the antherozoid is in this position, differentiation takes place, resulting in a typical nucleus in prophase. The contents of the female pronucleus before fertilization is massed around the nucleolus; after fertilization, however, the nucleus enlarges and its chromatin appears in masses, thin threads running between them. At opposite poles of the female pronucleus centrospheres may be seen.

The second paper was by Dr. Mabel L. Merriman, also of Hunter College, the subject being "Some Changes in the Cell Contents of Spirogyra during Conjugation."

Dr. Merriman said that after the union of the gametangia

there is a decided difference in the staining reactions of the conjugating cells and those which are not conjugating. The conjugating cells are clearer, not taking the stain so readily. This "clarification" seems general in the conjugating cells and may possibly be connected with the fact that their cell walls are thinner. The substances in suspension may have gone into solution. In the conjugating cells also, the nuclei at first seem to draw apart a little as if repelled. Sometimes two male cells conjugate with one female cell. In general, previous to conjugation, the pyrenoids are much larger.

A short discussion followed on the cause of conjugation, with the conclusion that it was probably essentially chemotactic.

An interesting specimen of a woody plant (*Bachira alba*) from the island of St. Thomas was shown by Dr. Britton. The bark was of a very corky nature and showed in places on the surface a peculiar green color.

Arthur H. Graves,
Secretary.

Meeting of April 8, 1924

This meeting was held at the American Museum of Natural History. Professor Richards occupied the chair. The Secretary of the Club gave an illustrated talk on the Civic Value of Trees, describing the life and growth of trees and the unfavorable conditions to which city trees are subjected, the diseases to which they are liable and correct methods of planting and treatment. The value of trees to a city was summed up as follows:

1. Beautify the city, making it a more desirable dwelling place.
2. Source of interest and pleasure at all times of the year.
3. Afford cooling shade throughout the hot summer period.
4. Enhance the value of real estate.
5. Improve the general morale of the community.

Arthur H. Graves,
Secretary.

Meeting of April 30, 1924

The meeting of this date was held in the Laboratory Building of the Brooklyn Botanic Garden.

Mr. Charles W. Deusner of the Boyce-Thompson Institute for Plant Research, Yonkers, New York, was elected to membership.

The communication from the Club to the Secretary of the Interior advocating withdrawal from entry of the region surrounding Glacier Bay, Alaska, with a view to the establishment of a national park there; and the reply of Mr. Arno B. Kammerer, Acting Director of the National Park Service, stating that a study of the ground is being made, were read by the Secretary, and by motion of Dr. Seaver were placed on file.

The proposition of Dr. R. C. Benedict, Chairman of the Special Committee to secure legislation for the protection of the native plants in the State of New York, that the Club appropriate $25 for the reprinting of the Brooklyn Botanic Garden Leaflet "Conservation of Beauty," and distribution of same to the school teachers of New York was put before the Club. On motion of Dr. Murrill, the proposition was referred to the finance committee of the Club with power.

Dr. James A. Faris, Research Fellow at the Brooklyn Botanic Garden, addressed the Club on "Factors Influencing Infection in the Covered Smut of Barley."

Dr. Faris reported that owing to a failure to receive adequate and consistent infections in attempts to determine the varietal resistance to the covered barley smut, an extensive study of the factors influencing infection was undertaken.

As the tabulated data and the photographs shown by lantern slides demonstrated, high infections were secured over a wide range of soil moisture, acidity and temperature. In fact very high infections were secured over much wider ranges of soil factors than are met with under field conditions. In attempting to correlate these data with previous failures, it was discovered that collections of smut from different localities and upon different varieties of barley varied in their ability to infect certain varieties. Further studies have demonstrated that this single morphological species of smut is made up of several biologic forms, some of which were shown in a trip through the experimental greenhouses.

Arthur H. Graves,
Secretary.

NEWS NOTES

The British Association for the Advancement of Science met in Toronto from the 6th to the 15th of August for its 92nd Annual Meeting. The Association is organized in thirteen sections which met separately. There were also joint meetings of two or three sections and general meetings of a popular nature. Among the papers read before the Botanical Section were the following:—

The Black Dot Disease of Potato, by Dr. B. T. Dickson.

The Growth of British Columbia Trees as Indicated by Annual Rings, by Dr. A. H. Hutchinson.

Certain Fluorescence Pigments and their Structural Relations, by Professor F. E. Lloyd.

On the Changes in Chloroplasts at Low Temperatures, by Professor F. J. Lewis.

On the Distribution of Potassium in Living Plant Tissues, by Mr. Dowding.

Parasitism in the Genus Comandra, by Mr. Moss.

The Botanical Situation in China, by Dr. J. M. Coulter.

The Effect of Noxious Gases on Plants, by Dr. William Crocker.

The Present Status of the Doctrine of Recapitulation, by Dr. E. C. Jeffrey.

Discussion on "The Ascent of Sap and the Transport of Food Materials in Trees," by Professors H. H. Dixon, D. F. Curtis, D. T. Macdougal, V. H. Blackman and J. H. Priestley.

Joint Discussion with Section D, Zoology on "Species Concept" and on "Chromosomes and Species," by Dr. Hyslop Harrison, Mr. J. S. Huxley, A. D. Peacock and others.

Excursions were also arranged for the visiting scientists to points of interest.

The California Bigtree Dates Back Before Adam

The history of the tree known as the Bigtree, or technically the *Sequoia Washingtoniana*, now found in isolated and sheltered spots in the Sierra Mountains of California, reaches back into the very beginnings of history, to a period when this tree probably covered the slopes of western coast mountains twice the height of the present ranges, and extended from some point well

north of 49° down into the Lower California peninsula. A factor in its present limited range, says the United States Forest Service, is the strange geological transformation that some hundreds of centuries ago came over what is now California.

The Biblical prophecy that the valleys shall be exalted and the mountains made low was very literally fulfilled in California some aeons before it was uttered by Isaiah. In the high mountain ranges of those days, running up to 20,000 feet or more in height, came a volcanic disturbance, so that molten lava poured through the valleys and stream channels, filling them up and blocking the streams. After the lava had cooled, it was so much harder than the granite of the original mountains that it resisted erosion as the granite could not. As a consequence, the granite peaks wore away, and the lava beds remained, until finally lava-covered ridges towered above deep canyons worn in the native stone, and streams flowed and still flow many thousand feet below the level of the streams once shaded by the Bigtree's grandsires.

Not long ago miners in the Tahoe National Forest working a gold mine 2,500 or 3,000 feet below the lava cap of one of the Sierra peaks, in one of the former streambeds, came across an old flood deposit in which were the tangled logs of a group of the Sequoias that once grew on the mountain slopes. Though buried for unknown thousands of years, the logs were in excellent preservation. They were changed somewhat in structure, but the annual rings in a cross-section of the wood stood out as plainly as though the trees had been felled only a few days before.

During the last thousand years the Bigtree of to-day has not reproduced appreciably, and at one time foresters felt that it was a dying species. Recently, however, efforts have been made, and with considerable success, to start plantations of the tree throughout California, outside of its present range.

Small plantations have been made in the Klamath National Forest in the northwest corner of the State, near Lake Tahoe in the central part, and in the Sequoia National Forest in the southern Sierras. In each of these localities the tree has far outstripped the native conifers. Even in competition with brush, which suppresses young pines and firs severely, the Bigtree has been able to develop successfully. In the 12-year

period since the earlier of these plantings some of the young trees have made a growth of 8 feet, against 4 or 5 feet as the best that local saplings have attained in the same time. Foresters are beginning to wonder whether the Bigtree may not some day reforest large areas of California by means of plantations similar to the experimental ones already established.

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Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

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(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

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BY

GEORGE T. HASTINGS

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TORREYA

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UNREPORTED PLANTS FROM LONG ISLAND*

I. Pteridophyta and Spermatophyta

N. M. Grier

Since assuming charge of the course in Field and Systematic Botany at the Biological Laboratory, Cold Spring Harbor, N. Y., the writer and his assistants have been engaged in making a card catalogue of the native and cultivated plants in the vicinity of the Laboratory, as these were collected by members of the staff and students. He has also examined and assembled records left by former workers at the Laboratory, and from these has prepared the following list of plants previously unknown, or at most, indefinitely reported from Long Island. In checking this list, not only were the earlier lists of Jelliffe, (3), and Grout, (4), consulted, but the more recent studies of Harper on Long Island vegetation, (6, 14, 15, 16), together with those of Johnson and York, (10), Harshberger, (12), Conard, (8), completing the final checking with Taylor's studies, (11, 20), those of Burnham and Latham, (9, 13, 17, 19), and Ferguson's two recent papers, (18, 21). The workers whose data, besides that of the writer, is presented in the following list are:—

Professor J. Arthur Harris, University of Minnesota, Minneapolis, Minn.

Miss Gail H. Holliday, Wheeling High School, Wheeling, W. Va. The taxonomy and nomenclature used are essentially that of the Illustrated Flora of the Northern States and Canada, second edition.

Our records confirm the presence on Long Island of the following species listed by Burnham and Latham, (1914):— *Bromus hordeaceus*, *Carex canescens disjuncta*, *Carex flexuosa*, *Scirpus paludosus*, *Salix purpurea*, *Lychnis dioica*, *Rubus phoeniculasius*, *Viola papilianacea domestica*, *Apocynum medium*,

* Contribution No. 6 from the Biological Laboratory, Cold Spring Harbor, N. Y.

Lycopus membranaceus, Nabalus trifoliolatus, Xanthium commune, Arctium minus, Solidago juncea: (1921), *Lathyrus latifolia, Galium mollugo.*

Additionally we have found on Long Island the following species listed by Ferguson, (1922):—*Filix Fragilis, Sagittaria Engelmanniana;* (1924):—*Aristida tuberculosa, Panicum microcarpon, Carex abscondita, Carex hystricina, Carex straminea, Cyperus erythrorhizus, Scirpus cyperinus, Juncus Greenei, Lilium philadelphicum, Trillium cernuum, Ulmus americana, Persicaria caryi, Persicaria pennsylvanica, Dondia maritima, Anemone virginiana, Aquilegia canadensis, Sarracenia purpurea, Lespedeza capitata, Rhus hirta, Acer platanoides, Acer saccharum, Utricularia gibba, Galium verum, Lonicera sempervirens, Hieracium canadense.* The localities of our species are mostly at Cold Spring Harbor.

POLYPODIACEAE

Dryopteris cristatum var. *Clintoniana* (D. C. Eaton). Woods, C. S. H. N. M. G.

PINACEAE

Picea excelsa Link. In cultivation, C. S. H. G. H. H.
Taxodium distichum L. In cultivation, Westbury, L. I. N. M. G.

POTAMOGETONACEAE

Potamogeton alpinus Bubs. Fish Hatchery, C. S. H. G. H. H.

GRAMINEAE

Diplachne fasciculus Beauv. Salt Marsh, C. S. H. N. M. G.

CYPERACEAE

Carex Asa-Grayi Bailey. C. S. H. vicinity. J. A. H.
Carex scoparia canadensis Fern. C. S. H. vicinity. J. A. H.
Carex tenuiflora Wahl. C. S. H. vicinity. J. A. H.
Scleria pauciflora caroliniana (Willd.) Wood. Hempstead Plain, Hicksville. G. H. H.
Scleria triglomerata Michx. Hempstead Plain, Hicksville, L. I. N. M. G.
Scirpus sylvaticus L. C. S. H. vicinity. G. H. H.

SALICACEAE

Salix petiolaris J. E. Smith. C. S. H. vicinity. J. A. H.

FAGACEAE

Quercus ellipsoidalis Hill. Near dunes, Bayville, L. I. G. H. H.
Quercus imbricaria Michx. Hodenpyl Estate, Locust Valley, L. I. N. M. G.

ULMACEAE

Ulmus alata Michx. Hodenpyl Estate, Locust Valley, L. I. N. M. G.
Ulmus campestris L. C. S. H. vicinity. N. M. G.

ARISTOLOCHIACEAE

Aristolochia macrophylla Lam. C. S. H. vicinity. N. M. G.

POLYGONACEAE

Persicaria punctata leptostachyum Meissn. C. S. H. Lake region. N. M. G.

NYCTAGINACEAE

Mirabilis Jalapa L. Cultivated, C. S. H. vicinity. N. M. G.

PORTULACACEAE

Portulaca pilosa L. Gilgo Beach, L. I. G. H. H.

CARYOPHYLLACEAE

Stellaria borealis Bigel. Shaded and wet places, C. S. H. G. H. H.

PAPAVERACEAE

Macleya cordata Willd. Escaped, Lloyd's Point, L. I. C. S. H. N. M. G.

CRUCIFERAE

Brassica Rapa L. Gardens and escaped, C. S. H. N. M. G.
Diplotaxis muralis (L) DC. Roadsides, C. S. H. G. H. H.

SARRACENIACEAE

Sarracenia flava L. Hodenpyl Estate, Locust Valley, L. I. N. M. G.

GROSSULARIACEAE

Ribes nigrum L. Escaped, C. S. H. J. A. H.

ROSACEAE

Potentilla monspeliensis norvegica Rydb. Vicinity C. S. H. N. M. G.
Rubus baileyanus Britton. C. S. H. vicinity. J. A. H.

Rubus canadensis L. Jones Woods, C. S. H. J. A. H.
Rubus neglectus Peck. Huntington Hill Road, C. S. H. N. M. G.
Schizonotus sorbifolia L. Road to Sandspit, C. S. H. N. M. G.
Filipendula rubra (Hill) Robinson. Escaped, Lloyd's Point, L. I. N. M. G.

MALACEAE

Sorbus aucuparia L. C. S. H. vicinity. N. M. G.

LINACEAE

Millegrana Radiola L. C. S. H. vicinity. N. M. G.

EUPHORBIACEAE

Pachysandra procumbens Michx. De Forest Estate, C. S. H. N. M. G.

CELASTRACEAE

Evonymus atropurpurea Jacq. Cultivated and escaping, C. S. H. G. H. H.

BALSAMINACEAE

Impatiens noli-tangere L. Jones Marsh, C. S. H. N. M. G.

MALVACEAE

Callirhoe involucrata (T. & G.) A. Gray. Sanderson Estate, Locust Valley, L. I. G. H. H.

VIOLACEAE

Viola arvensis Murr. Near Laboratory, C. S. H. G. H. H.
Viola sororia Willd. C. S. H. vicinity. G. H. H.

ELAEAGNACEAE

Elaeagnus argentea Pursh. Jones Farm, C. S. H. N. M. G.

UMBELLIFERAE

Aegopodium Podograria variegatum Bailey. Fish Hatchery, C. S. H. G. H. H.

ERICACEAE

Ledum groenlandicum Oeder. Havemeyer Estate, Locust Valley, L. I. N. M. G.
Oxydendrum arboreum (L.) DC. Near R. R. Depot, C. S. H., cultivated. N. M. G.
Vitis-Idea Vitis-Idea (L.) Britton. Bayville, L. I. N. M. G.

STYRACACEAE

Halesia carolina L. Escaping, C. S. H. vicinity. J. A. H.

OLEACEAE

Fraxinus americana (L.) var. *aecidiosa* Shull. Huntington Hill Road, C. S. H. N. M. G.

LABIATAE

Mentha citrata Ehr. C. S. H. vicinity. N. M. G.
Perilla frutescens (L.) Britton. Waste fields, vicinity, C. S. H. N. M. G.
Salvia Lyrata L. Matheson's Estate, Lloyd's Neck, L. I. G. H. H.

SOLANACEAE

Physalis viscosa L. Vicinity of Laboratory, C. S. H. G. H. H.

RUBIACEAE

Galium trifidum pusillum (L.). Pine Barrens, St. James, L. I. N. M. G.

CICHORIACEAE

Hieracium praealtum decipiens Koch. Pine Barrens, St. James, L. I. N. M. G.

AMBROSIACEAE

Xanthium pennsylvanicum Wallv. C. S. H. vicinity. G. H. H.

COMPOSITAE

Antennaria neodoica Greene. C. S. H. vicinity. N. M. G.
Aster Herveyi Gray. C. S. H. vicinity. J. A. H.
Aster paniculata acutidens Burgess. C. S. H. vicinity. J. A. H.
Coreopsis tinctoria Nutt. Pine Barrens, St. James, L. I., escaped. N. M. G.
Matricaria suaveolens (Pursh) Buchanan. Hempstead Plain, Hicksville, L. I. N. M. G.

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Dartmouth College,
Hanover, N. H.

A NEW HEART-LEAF AND OTHER INTERESTING PLANTS FROM AUTAUGA COUNTY, ALABAMA

Roland M. Harper

In May, 1924, on my way to my principal southern headquarters in Alabama after a few months' work in Florida, I spent a week-end (17th to 19th) with an ornithologist friend, Ernest G. Holt, at the home of his uncle, Lewis S. Golsan—a farmer and naturalist—near Booth in Autauga County. Booth is a railroad junction about six miles west-northwest of Prattville, the county-seat, and Mr. Golsan's farm is about two miles east of Booth and five miles from Prattville by road, and about one-half mile west of Bridge Creek, which flows in a general southerly direction toward the Alabama River.

The locality under consideration is just about at the southern edge of what I have described as the long-leaf pine hills division of the central pine belt of Alabama.* Its underlying strata are pinkish and yellowish sands and sandy clays, near the top of the Tuscaloosa formation (fresh-water Cretaceous), and the soils are rather sandy. A mile or so to the southward, across the Mobile & Ohio R. R. and the valley of Autauga Creek, is a steep wooded escarpment perhaps 200 feet high (which at Prattville looks like a small mountain), of the Eutaw formation, which overlies the Tuscaloosa and is at least partly of marine origin, and gives rise to somewhat richer soils.

The northern part of Mr. Golsan's farm is higher than the house, and two or three small streams (branches), originating in seepage springs, flow down the slope toward the house, and soon unite into a larger one flowing into Bridge Creek. Around the heads of some of the branches are small areas of sandy bog similar to those described from the same region by the writer a few years ago,† and a little farther down the streams flow through small swamps with the neighboring slopes more "mesophytic," having a small accumulation of humus. The uplands between the branches are in some places dry and sandy, with pine-barren vegetation, and elsewhere more fertile, with more deciduous trees and shrubs.

On the east side of Bridge Creek, about half a mile from Mr.

* Geol. Surv. Ala., Monog. 8, pp. 78–81. 1913.

† Torreya **22**: 57–60. 1922.

Golsan's, are bluffs with more loamy and moderately fertile soil, sometimes precipitous and sometimes gently sloping, rising to a height of 100 feet or more, and pretty well wooded. The vegetation on the more gentle slopes varies in density and luxuriance with the distance from the water, exposure to sun, etc., that near the base being fairly typical climax forest or rich woods, passing into dry woods higher up. On the most precipitous bluffs, where there is more exposure to sun and wind, but also better protection from fire, are a few plants that seem to be sensitive to fire (pyrophobic), such as *Illicium*, *Kalmia latifolia*, *Oxydendrum*, and *Symplocos*.

About half a mile farther south, after passing under the railroad, Bridge Creek flows into Autauga Creek, in a swampy bottom about one-half mile wide. Near this point, where the swamp is presumably sandier than usual, is one of the few known Alabama localities for *Pinus serotina*.* The large tree which I had seen several times from trains (and photographed in 1906) is still standing, and accompanied by a few smaller ones.

About four miles south of Booth, among the hills of the Eutaw formation, is a large creek swamp known as Bear Swamp, a tributary of the Alabama River. On the 19th I went into this swamp near its upper end with Mr. Golsan and Mr. Holt, who had hunted birds and other animals in it for many years. In recent years there has been some agitation for draining this swamp, on account of the widespread prejudice against swamps of all kinds; but if the part I saw is typical, draining it would do very little good from the standpoint of either agriculture or health. For it is a non-alluvial swamp, with the deepest peat I have ever noticed in Alabama. We had no way of measuring the total depth of the peat, but it is evidently several feet. A curious feature of the swamp is the presence of several deep pools of clear water with precipitous edges, not visibly connected with any channel. The only way I can account for them is that they may represent holes burned in the peat by fire during some extremely dry season, perhaps a generation ago. The vegetation of the part I saw has much in common with that of the Dismal Swamp of Virginia, and a bay and gum swamp near Tallahassee, Fla.,† the commonest trees being *Magnolia*

* See Bull. Torrey Bot. Club 33: 524. 1906.

† See 3d Ann. Rep. Fla. Geol. Surv. pp. 254–255. 1911.

glauca, *Pinus Taeda*, *Nyssa biflora*, and *Acer rubrum*. A few other plants seen there will be mentioned farther on.

So much for the general environment of the plants to be noted below. About an hour after our arrival at the farm (May 17) I was walking with Mr. Holt down alongside of one of the spring branches about 200 yards north of the house, and about at the point where the sandy bogs ended and the richer woods began I noticed a few specimens of a heart-leaf (*Hexastylis**), and was about to pass them by as being the common *H. arifolia*, when Mr. Holt stooped down and pulled up a plant, with the remark, "What's this?" I then saw at once that it had flowers very different from those of *H. arifolia*, or any other species known to me, and I made a note of the time (5:45 p. m., Central Time), as I often do when I think a new species has been discovered.

To the eye the leaves of the new plant are scarcely distinguishable from those of *H. arifolia*, being hastate-cordate, faintly mottled above with different shades of green, a few inches long, with terete purplish petioles a little longer than the blades. But they lack the characteristic "medicinal" odor of *H. arifolia*, and we found the next day that we could distinguish the two species by their odor even when no flowers were present, as is often the case. (Like several other perennial herbs, every plant does not bloom every year, but whether the flowerless ones are simply too young, or they bloom only in alternate years or something like that, has not yet been determined.)

The plant resembles its congeners in growing in small tufts, with branching and slender but fleshy rootstocks.

The calyx or perianth (called hypanthium by Small) is about an inch long, greenish purple outside (like the petioles and peduncles), and instead of being pitcher-shaped as in *H. arifolia*, is abruptly expanded near the middle, in a manner difficult to describe but well shown by the accompanying illustration. The three calyx-lobes, which sometimes spread more

* This genus of Rafinesque's has been united with *Asarum* by most taxonomists who have dealt with it, except Small, but it seems abundantly distinct by its superior ovary and several other characters. (Some 19th century authors made it a section *Heterotropa*, under *Asarum*.) "Heart-leaf" seems to be the universal common name for any species of *Hexastylis* in Georgia and Alabama, if not throughout the South, but like many other southern plant names, it does not seem to have found its way into books written by northern botanists.

Hexastylis speciosa. About one-third natural size.

widely than those shown, making the perianth almost salver-shaped, are longitudinally striped within with dark purple bands, thus suggesting an affinity to *Aristolochia* more strongly than any other *Hexastylis* does.

The peduncles, about the same length as the flowers, are curved above in such a way that the flowers rest on the ground with their axes approximately horizontal, instead of being erect as in other species of the genus. Although the essential organs of the flower were not examined closely, they do not seem to differ materially from those of *H. arifolia.* (No insect visitors were observed, but it is a reasonable supposition that pollination is effected by some small insects that crawl on the ground.)

For the species here described I propose the name **Hexastylis speciosa,** in allusion to its showy flowers. (Any one who does not believe that *Hexastylis* is sufficiently distinct from *Asarum* can call it *Asarum speciosum.*)

A few minutes after Mr. Holt's discovery we noticed a fine clump of the same thing in richer woods farther down the same branch, and decided to leave it until the next day, and then bring it to the house and photograph it while it was fresh. In

the meanwhile Mr. Holt made a pencil sketch of one of the flowers, from the specimen he first gathered, and that has helped me to describe it after the flowers of the plants taken for herbarium specimens had lost their shape by pressing. On Sunday his sister, Miss Olivia Holt, who came out to the farm for a few hours with an automobile party, took a specimen back to Montgomery with her, and the next day, without any suggestion from me, had a professional photographer make the photograph which is used herewith. This shows the appearance of the plant better than words can, and makes a description almost unnecessary, except for size and colors.

On Mr. Golsan's farm the new species seemed to be the only *Hexastylis* present, but on Sunday we found both it and *H. arifolia* fairly common in rich woods along the Bridge Creek bluffs, and there we soon learned to distinguish the two species by their odor. On Monday, the 19th, I went with Mr. Golsan and Mr. Holt south from Booth several miles across the hills of the Eutaw formation, and there we found only *H. arifolia*. Again a few weeks later, when I was walking part of the way from Montgomery to Tuscaloosa on June 10 and 11, I found only *H. arifolia* in rich woods near the southeastern corner of Autauga County, and in similar situations in southeastern Bibb County. Although *H. speciosa* may turn up later in other counties, for it can easily be mistaken for *H. arifolia* at other seasons than spring, or even in spring if one does not look closely—for its flowers do not differ much in color from the decaying tree leaves among which they rest—it seems likely that we have one more to add to the rather long list of very distinct and handsome plants which are more abundant in Alabama than anywhere else, if not confined to the state. (Examples are *Magnolia macrophylla*, *Illicium Floridanum*, *Neviusia Alabamensis*, *Hydrangea quercifolia*, *Polygala Boykinii*, *Croton Alabamensis*, *Aesculus Pavia*, *A. parviflora*, and *Laciniaria polyphylla*.)

A few other plants found in the same neighborhood deserve special mention. The references to Dr. Mohr of course mean Charles Mohr's Plant Life of Alabama (1901).

Rhynchospora Grayii Kunth. On dry sandy uplands near Bridge Creek. Known to Dr. Mohr only from Baldwin and Mobile Counties, near the coast.

Lachnocaulon anceps (Walt.) Morong. Sandy bogs near heads

of branches on Mr. Golsan's place. Known to Dr. Mohr only from the "coast pine belt," but it grows also on Lookout Mountain, with several other coastal plain plants.

Uvularia sessilifolia L. Shady edge of branch-swamp on Golsan's place. Ranges chiefly northward.

Smilax Walteri Pursh. In Bridge Creek Swamp. Known to Dr. Mohr only from Clarke County and southward.

Persea pubescens (Pursh) Sarg. In Bear Swamp. Known to Dr. Mohr only from the "lower pine belt" and "coast plain;" but I had found it some years ago among the mountains of Clay County.*

Calycanthus sp. Common on moderately fertile uplands on Mr. Golsan's place, and in bloom at the time of my visit. Dr. Mohr lists two species, one from the highlands and one from near the coast, but I have never learned to distinguish them. I had no record of any member of this genus from the central pine belt before, though.

Ilex coriacea (Pursh) Chapman. The most abundant shrub in the part of Bear Swamp that I visited. This is near its inland limit.

Stewartia Malacodendron L. A single specimen, in bloom, in rich woods near Bridge Creek. This handsome shrub seems to be much rarer than one might suppose from the books. Dr. Mohr found it in Cullman County (locality and abundance not specified), and at one place in Mobile County (in 1879 only), and cited a specimen collected by Dr. E. A. Smith in Tuscaloosa County. Dr. Smith's plant was found about five miles east of Tuscaloosa, in the 70's, but he has never been able to locate it again, although a special search for it was made in 1923. I found it near Greenville, in Butler County, in June, 1906.

Azalea. At least two species or varieties, apparently near *A. viscosa*, were in bloom on Mr. Golsan's farm at the middle of May, but the splitters have been at work on this genus lately, and I could not identify them without taking specimens along for study, which I was hardly prepared to do. There are also a few *Vacciniums* there that might be worth investigating.

Pieris nitida (Bartr.) B. & H. In Bear Swamp and one or two other non-alluvial swamps in the neighborhood. Known to Dr. Mohr only from the "lower pine region" and "coast plain."

* See Torreya **10**: 220–221. 1910.

Lysimachia quadrifolia L. In dry woods near Bridge Creek, not common. This may be the southernmost known station for it. Dr. Mohr knew it only from Sand and Lookout Mountains.

Pinguicula pumila Mx. Sandy bogs near springs on Golsan's farm. Known to Dr. Mohr only from Baldwin and Mobile Counties, but I found it in similar places in Chilton County a few years ago.* In the central pine belt it grows larger than it does farther south, and might be mistaken for *P. elatior* in dried specimens, but the color of the corolla is more like that of *P. pumila* than *P. elatior*.

Utricularia subulata L. With or near the preceding. Commoner southward, but grows also on Lookout Mountain.

University, Ala.

A TRIP TO EL YUNQUE, PORTO RICO

Elizabeth G. Britton

From the windows of our rooms at the Condado, the Luquillo Range of mountains—filling the northeastern end of the Island—loomed up, misty and blue in the early morning, or cloud-capped in the afternoon, and continually tempted us to come and see its wonders! One of the keenest disappointments of all our West Indian journeys had been that I was unable to join my husband and a party of botanists in a camping trip from Naguabo in 1913 to El Duque at the other end of the range. Having helped to take care of the plants and studied the mosses from that trip, I could faintly imagine what treasures awaited us on El Yunque. It is called the "Anvil" from the flat top so characteristic of the northeastern end of the range, and is 3,700 feet high.

Through the courtesy of the Forestry Department of the Federal Government of Porto Rico, and the kindness of Mr. Murray Bruner—Chief Forester—all arrangements were made for us to start from Mameyes on horse-back by the Catalina trail, for a "week-end" visit to the forest-ranger's huts of the Luquillo Forest Reserve. So we motored down to the Mameyes River, bag and baggage, ready to "rough it" and get wet.

* See Torreya **22**: 59. 1922.

The cabins were comfortable and water-proof and we spent three nights there, a party of five botanists, and several of the native foresters came to help in the day-time. The trail up is through sugar and coffee plantations and yielded little of much interest until we reached the station at about 1500 feet. We arrived there in time to take a short walk along the newly stoned trail, toward the summit, and become a little familiar with the more common plants at the lower altitudes. Here we found *Hillia parasitica* with its starry white waxy blossoms, and *Magnolia splendens* with showy cream-colored flowers; passion-flowers and *Anthuriums* climbed the trees, mistletoes and ferns perched upon them, tree-ferns mingled with them and ferns and mosses covered the ground. *Selaginellas* and *Lycopodiums* were abundant, and hepatics and lichens helped to make a bewildering luxuriance of plant growth.

The ferns were particularly abundant and represented by many genera—*Asplenium* and *Adiantum*, *Polypodium* and *Rhipidopteris*, *Trichomanes*, and *Hymenophyllum*, *Vittaria* and *Elaphoglossum* in abundance and beauty. We were particularly pleased with *Oleandra articulata*—its simple glossy fronds pendent in large masses on the trunks of trees—and a few ground orchids, and an interesting *Apteria* were also found.

The first good moss collected was on the shady side of a big boulder in the bed of a stream, crossing the path—*Homalia glabella* and with it *Fissidens polypodioides*. Masses of *Macromitrium mucronifolium* and *Leucoloma serrulatum* made cushions on trees and stumps. *Leucobryum crispum* and *L. Martianum* were abundant and mixed with species of *Campylopus*, which in the tropics takes the place of the *Dicranums* which are usually so abundant on our northern mountains. The old logs were fascinating places to linger over, searching for filmy ferns, hepatics, and mosses.

A comfortable night on clean new cots with plenty of blankets and good camp fare, with delicious Porto Rican coffee, started us off next day rested and keen for our trip to the summit. The horses took us part of the way up—as far as the trail was possible for them to go; the rest of the way was too steep and muddy, so we left them with a care-taker and started off—each of us with a "practico" or forest-ranger to help us, and began collecting. Mr. Bruner and Dr. Britton watched for new or interesting

trees and kept the men with the machetes busy. My big basket soon was overflowing and particularly fine clumps of ferns and lycopodiums were left to be picked up on the way down. So many stops were made and such interesting specimens found, that we were neither tired nor out of breath when we reached the wonderful rain-forest of the flat ridge below the summit of El Yunque. Of all tropical mountains that we have ever climbed, this has the densest vegetation and is most unspoiled by the ravages of man. The trees were so covered with mosses and hepatics, that the trunks were invisible, and ferns and orchids grew upon them in masses. The rare fern *Hymenodium crinitum* was exceedingly abundant and of large size. *Olfersia cernua*, *Trichomanes crispum* and *Hymenophyllum polyanthos* were also abundant,—*Elaphoglossums* and *Gesnerias* hung from the trees, and a beautiful white epiphytic orchid *Octadesmia montana* grew on the bushes along the path. Dense cushions of a rare moss—only found on high mountains—*Hemiragis aurea* were everywhere and mixed with it were pillows of *Macromitriums*. The *Hookeriaceae* also were abundant, and *Hookeriopsis acicularis* covered the stones in the path. Another beautiful moss of this family found hanging at the end of twigs—*Isodrepanium lentulum* with its symmetric branching and glossy leaves made it particularly lovely and tempting. Mixed with it were our old friends of the Blue Mountains of Jamaica—*Meteoropsis remotifolia*, *Pilotrichella flexilis*, *Phyllogonium fulgens*, and *Thuidium acuminatum*. Also quite familiar and abundant were *Porotrichum insularum* and *Clastobryum trichophyllus*.

On the last muddy scramble a few plants of *Hookeria acutifolia* were found. In the crevices of the rocks on the bare summit were dense black masses of *Thysanomitrium Richardi* and in these wet cushions grew a tiny pale *Utricularia*, now called *Setiscapella pusilla*. Two rare ferns also grew in the crevices of the rock in wet cushions of mosses—*Psilogramme Portoricensis* and *Pleurogramme minor* but were not abundant.

As we sat down to lunch, it began to rain and drove us away from the exposed and windy ledges to the shelter of the forest—but even here there was little comfort, and we turned homeward—realizing that our baskets and packs were full and absorbing water all the time. So it was a wet and tired party that dragged into camp a few hours later, soaked through and through.

Part of the next day it rained and we stayed indoors and were kept busy sorting and pressing the most perishable parts of the collections. Fortunately, mosses, hepatics, and lichens can wait for light and comfort, so they were bundled up and carried down to the Condado, where with plenty of running water, cloths and trash baskets, it took four days more to clean and arrange and number my collection, and the subsequent study has shown it to be one of the largest and most interesting of all our red-letter day gatherings.

New York Botanical Garden.

SHORTER ARTICLES

A New Bog-asphodel from the Mountains.—Four known species have heretofore comprised the genus *Abama*. Two American, one on the eastern coast and one of the western coastal region. The other two are European and Japanese respectively. The following or fifth species may be described as:

Abama montana Small, sp. nov. Perennial with a fibrous-coated rootstock, sometimes tufted: basal leaves erect, mostly 1–2.5 dm. long, narrowly linear, about 8-veined, acuminate: flowering stem 3–5 dm. tall, slender, glabrous, with several remote narrow leaves which clasp the stem: raceme 5–8 cm. long, rather loosely flowered: bracts setaceous, mostly 3–8 mm. long: pedicels about twice as long as the bracts, slender: perianth yellow: sepals almost linear, 6 mm. long, 3-veined: petals narrowly linear-lanceolate, 3-veined: stamens about 4 mm. long; anthers fully 1.5 mm. long: capsule narrowly conic, shorter than the persistent perianth.—Swamp near Flat Rock, North Carolina.

It is not surprising that a bog-asphodel should come to light in the mountains of North Carolina, as several kinds of plants otherwise known only in the pine-barrens of the middle Atlantic Coastal Plain also grow in the Appalachians. However, it is interesting that the plant in question is a different species from that of the lowlands. It is scarce, evidently rare, and may be on the verge of extinction. It may be that in this species we have one of the progenitors of the *Abama* of the Coastal Plain, for the high mountain region was the reservoir whence many of our Coastal Plain plants were derived.

The habit and the foliage of the two species in question are much the same, but in the inflorescence of *Abama montana* we find long slender pedicels, and in the flower itself larger sepals and petals, larger stamens and smaller capsules than in *Abama americanum.*

The type specimens were collected near Flat Rock, North Carolina by F. M. Crayton, July, 1919, in flower, and at the same place by C. D. Beadle and F. M. Crayton, later in the same month, in fruit. Type specimens are in the herbarium of The New York Botanical Garden.

John K. Small

CROWBERRY AT MONTAUK, LONG ISLAND

Norman Taylor and Helen Smith Hill

The discovery of *Empetrum nigrum* within a couple of hundred feet of the temporary laboratory of the Brooklyn Botanic Garden at Montauk, Long Island, brings an interesting species into the local flora range, and, of course, into the flora of Long Island.

The plant was found on the open exposed Downs about 1500 feet west of the Ditch Plain Coast Guard Station, within 100 feet of the bluff that at this point overlooks the ocean beach, which is here about forty feet below the Downs.

While the plant is known at sea level along the cool shores of the coast of Maine, and from mountain summits above timberline in the Adirondacks, and some of the higher mountains of New England, it has never before been recorded from anywhere on the coastal plain of the local flora area. As in the case of the cloudberry (*Rubus Chamaemorus*) found in 1908, the discovery of this Arctic-alpine species at Montauk opens up interesting possibilities of glacial relics or bird migrations, which is also true of the red spruce station at Orient, Long Island.

Specimens of this plant will be deposited in the herbaria of the Brooklyn Botanic Garden and The New York Botanical Garden.

Montauk, Long Island,
July 31, 1924.

Addenda to "Contributions to the Flora of Long Island" by William C. Ferguson published in the Bulletin of the Torrey Botanical Club, May, 1924.

Isotria affinis (Austin) Rydbg.

Isotria verticillata (Willd) Rap.

In the article referred to above the writer stated that he had found no *Isotria verticillata* in the woods where he found at widely separated points two plants of *I. affinis* in 1923, This season he has found two very large and scattered colonies of *I. verticillata*, but not near where *I. affinis* was found in these these same woods.

Hempstead, N. Y.,
July, 1924.

PROCEEDINGS OF THE CLUB

Meeting of May 13, 1924

The meeting of this date was held at the American Museum of Natural History. Mr. Beals read a communication from Mr. Walter M. Weaver, Chairman of the Committee for Club Cooperation at the National Outdoor Sports Exhibition at the Grand Central Palace, N. Y., May 26–31, 1924. The letter asked for the cooperation of the Torrey Botanical Club in the way of exhibits and representatives—the main idea being to spread propaganda for preserving the natural beauties of the country. Dr. Hazen moved that the Club be represented and that the expenditure be limited to $20. The motion, seconded by Dr. Rydberg, was approved by the Club. The formal program of the evening consisted of an illustrated lecture by Dr. Ralph R. Stewart of Gordon College, Rawalpindi, India, on "Plant Collecting in Western Tibet." Dr. Stewart has been a professor in a missionary college in Northern India since 1911 and has at times visited the arid mountainous region behind the Great Range of the Himalaya Mountains.

Western or Little Tibet is a part politically of the Native State of Kashmir, but the people and the country are Tibetan. The whole country lies above 9,000 feet and is drained by the Indus River and its tributaries. There is little cultivation because of the lack of rain and the ruggedness of the country. There is no

forest and every village has a small plantation of willow and poplar trees to secure a supply of poles for their flat-roofed, adobe houses.

The chief fruit trees are the apricot, mulberry, walnut and apple. The chief food grains are barley, buckwheat, wheat, millet, Chenopodium, and Amaranthus. The wealth of the people consists in their flocks of sheep, goats, and yaks. Many of the shepherds are nomads and live a great deal of the time at altitudes of 12,000 to 15,000 feet.

About 825 kinds of flowering plants have been reported from this country. Many of them are alpine plants which are also to be found in Kashmir. These are only found near melting snow or the streams and are not typical of the flora as a whole, which is more related to the flora of Tibet and Siberia. A great many mesophytic weeds are common in the villages.

The commonest plants to be found near water and on the high passes are polygonums, pinks, buttercups, corydalis, sedums, saxifrages, potentillas, astragali, primulas, androsaces, gentians, mints, Gallardias, and saussureas. In the deserts the chief orders are Chenopodiaceae, Cruciferae, Leguminoseae, Boraginaceae, and Compositae. Artemisia is probably the commonest genus in the compositae. Typical plants of the desert areas are *Ephedra Gerardiana*, *Eurotia ceratioides*, *Lepidium latifolium*, *Christolea crassifolia*, *Rosa Webiana*, *Astragalus* sp., *Heracleum* sp., *Acantholimon*, *Nepeta* sp., *Stachys tibetica*, and *Echinops cornigerus*.

About eighty plants were found at altitudes of 15,000 feet or over. They were naturally very small as it may freeze any night of the year at these heights. A rhubarb and *Delphinium Brunonianum* were the largest of these alpines. They were chiefly grasses, Caryophyllaceae. Cruciferae, Potentilla, Oxytropis, Nepeta, and Composites. The edelweiss, *Leontopodium alpinum*, the common dandelion, thyme, *Chenopodium album*, *Poa pratensis* and *Triglochin maritima* are probably the plants among these eighty that are familiar to botanists in this country.

ARTHUR A. GRAVES,
Secretary.

NEWS NOTES

On September 24th the Boyce-Thompson Institute of Plant Research was dedicated in Yonkers. The Institute, besides offices and well-equipped laboratories, has a variety of conservatories and propagating rooms where not only the amount of light, heat and moisture may be accurately regulated but also the chemical composition of the air. A popular account of the Institute is given in the Outlook of October 8th.

Rensselaer Polytechnic Institute of Troy celebrated its one hundredth anniversary on October third and fourth. While the Institute is now a technical and engineering one, it was in its early years the most important college of natural sciences in the country. Stephen Van Rensselaer, who founded the Institute, selected Amos Eaton to organize it, and appointed him senior professor. Eaton was the first to introduce field work and laboratory methods into American colleges. He attracted men interested in natural sciences from all parts of the country and enthused them in their work. Men trained by him founded the departments of science in many colleges. Many of the most eminent scientists of that time began their work under Eaton—among them Asa Gray and John Torrey. His influence on the education of women was very great. Women were not admitted to Rensselaer but they attended Eaton's public lectures and some special courses and were taken on field trips. Among these Jane Welsh, Almira Lincoln and Laura Johnson were among the first women teachers and writers on botany. Eaton also established the first popular museum of natural history in America at Troy. Rensselaer, through its courses and through its methods, exerted a profound influence on the sciences of botany, geology, entomology and agriculture and on scientific education in America America.

The National Park Service have been issuing a weekly bulletin or leaflet with short, interesting notes on the plants and animals of the Yosemite National Park. They have a Natural History Museum and all visitors are requested to aid the Park Naturalist, Ansel F. Hall, in protecting the fauna and flora from vandalism. Mr. Hall says that "each year they find it easier to protect the flowers, and the cooperation of the Public is now becoming very wholesome." Of the twelve hundred species in the Park, many of which are indigenous, perhaps the most important candidate for extinction is the snow plant. It is rigidly protected, and many unknown details of its reproduction are still awaiting discovery.

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BY

GEORGE T. HASTINGS

John Torrey, 1796-1873

CONTENTS

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November–December, 1924

SKETCHES OF TRAVEL IN SOUTH AMERICA

William A. Murrill

The Botanical Garden in Rio

The "Van Dyck" arrived at Rio on Sunday afternoon, January 27, and remained there until Tuesday morning, giving the passengers time to stretch their limbs a bit and look about the city. The place of greatest interest to me was the "Jardim Botanico," so I spent Monday morning there. Leaving the boat at seven, after a light breakfast, I walked up the Avenida to the Avenida Hotel and boarded a trolley which took me to the garden without transfer in less than an hour. I gave the conductor a 5 mil reis note, from which he extracted 400 reis for the fare one way, or about 4 cents. The route lay through a beautiful section of this most beautiful city, passing along or near the Avenida, the site of the recent Exposition, the harbor with its beaches, and the base of Corcovado where so many splendid homes are located, embowered in all the beauty of vegetation which the Tropics afford. Finally, the car was stopped on the Rua Jardim Botanico and I was put off at the entrance to the garden.

At this early hour, I was the only visitor, and I enjoyed the freshness and quiet and the singing of the birds all by myself, while wandering around under the fine old trees and watching the brilliant *Heliconia* butterflies flitting about in the sunny spaces. Everywhere there was cool shade, and restful benches, and pavilions, and the sound of water gurgling in brooks or leaping in cascades from the steep sides of Corcovado. Ferns and orchids and great climbing vines covered the ancient tree-trunks while water-lilies and other aquatic plants adorned the streams and ponds. Even the lowly fungi forced themselves upon my attention in the shape of a splendid display of the green-gilled *Lepiota* growing on the bank of a brook beneath a large breadfruit tree. There were 13 fine plants in the group and

some were shedding their spores in bluish-green clouds. This species has been named several times from South America, where it grows best and is sometimes eaten by the natives. Its northern limit is Ohio, where it goes under the name of *Lepiota Morgani* and is considered somewhat poisonous. The green spores are very characteristic.

Beyond a little glass house filled with delicate ferns I saw a laborer mowing the rough grass and stopped for a moment to watch him work. His scythe was short and very broad, and fixed to a long upright handle, which allowed him to stand upright while mowing. I noticed that he stopped to whet as often as laborers usually do, but we must remember the climate and the peculiar toughness of this particular grass. A large, well-filled water-jar reposed under a tree nearby. The tamancos he wore protected only his toes, and every few minutes a pebble or a thorn would have to be removed from some sensitive place between the flapping soles and the moving heels. A little plant which served for grass and did not require mowing was planted very generously throughout the grounds, especially in deeply shaded places. It is a very dark green, densely tufted, and has narrow, ribbon-like leaves resembling those of Crocus or Narcissus. I must get some of it for our greenhouses, because I am sure it would make an excellent bedding plant for the bases of palms and for spaces between trees that are planted out, being larger and darker than any we now have for this purpose.

But the trees in this famous old garden—who shall describe them! I am fond of trees and have watched them all my life, but I can not do these justice. The whole garden is really a grove of wonderful trees. The royal palms alone would make a story. There are many of them,—some planted in long avenues and others scattered,—and most of them over 100 feet high. The parent of them all, now 130 feet in height, was planted by King John VI, founder of the garden, on June 13, 1808. Mango and breadfruit trees are likewise abundant, the latter loaded with immense, rough fruits which keep falling and decaying, leaving behind masses of whitish seeds. Then there are great clumps of bamboos, rows of traveler's trees, royal poincianas, acacias, and trees that furnish rubber, cinnamon, cloves, nutmeg, camphor, and other products too numerous to mention. I shall visit the garden again on my return here in March, when I shall

live in one of the little chalets up on the side of Corcovado, surrounded by the virgin forest.

The New York Botanical Garden,
Bronx Park, N. Y. C.

WATER PLANTS OF THE KANAWAUKE LAKES

George T. Hastings

The Kanawauke Lakes are a group of three small lakes between Rockland and Orange Counties, New York, in the Bear Mountain-Harriman section of the Palisades Interstate Park. Only one of these, the First Lake, is natural. This was formerly known as Little Long Pond. When the other lakes were formed by damming the outlet stream in 1914 the level of the First Lake was raised about three feet. The lakes are connected by short channels some eight feet wide in the narrowest places. First Lake is about half a mile long, Second and Third Lakes a little less than one mile each. All of them are narrow and comparatively shallow. The current from First Lake through the others is slight, even in spring and early summer when the water is high, later in the season there is practically no current except that caused by the wind. On the shores of the lakes are located a group of some twenty camps where about ten thousand boy scouts spend from two to eight weeks during the summer. There is, consequently, a good deal of rowing on the lakes, while a number of motor boats make daily trips from the headquarters building at the junction of the Second and Third Lakes to each of the camps.

It would seem as if the current, supplemented by the movements of the boats, would have resulted during the ten years since the dam was built in a fairly uniform distribution of the water plants of the lakes. This is very far from being the case. The original lake has an abundant flora, the shallower water everywhere, including the areas submerged when the level was raised, being crowded with plants and the new shore line bordered uniformly by water or marsh plants. The Second Lake is almost as well supplied with plants at the end nearest First Lake, but further down the number both of species and individuals decreases. In Third Lake there are few plants, the greatest

abundance being in a bay that was a spring-fed swamp before the lake was formed. This difference is in the number of species and in abundance as well, only a few, such as *Eleocharis acicularis* and the Mermaid-weed, *Proserpinaca palustris*, being abundant in all the lakes. Thirty-seven species are found in First Lake, twenty-four in Second Lake and sixteen in Third Lake. All of the plants found in Second Lake are also found in First and all those in Third are also in both Second and First Lakes. An exception may be made in the case of *Elodea*,—formerly abundant in First Lake, it seems to have entirely disappeared from there, but has become common in Second and Third Lakes. Fifteen of the plants found are typical shore plants, growing in the water with the plant mostly above water, such as cattails, burweed, pipewort, water plantain, etc. Nine of the plants are rooted with the leaves floating or slightly raised above the surface, as water lilies, water shield, floating heart, etc. Seven of the plants are rooted and entirely submerged, as *Elodea*, most of the pondweeds and water milfoil. Six are usually free floating plants, as the purple and large yellow bladderworts, and duck weed. In First Lake the new area added by the raising of the level of the water has been occupied chiefly by the moving in of plants formerly growing in the shallow water, so that the plants are now growing under conditions similar to their original ones. A few plants have seemed unable to move and are growing under abnormal conditions. *Eleocharis Robbinsii* is found only at one point along the shore, and there in water about four feet deep, evidently where it had been growing before the level of the water was raised. Now the flowering stems reach only one or two inches above the surface, the submerged leaves, about eighteen inches long, are far below. *Peltandra virginica*, though growing commonly in shallow water along shore, is also found in places in water over three feet deep where there was originally only a swampy margin. Water milfoil, commonly floating free in great masses or rooted and the stems floating near the surface, also grows rooted in six feet of water, with the stems never reaching the surface.

The floating plants, or such as may break free and float, as the purple and yellow bladderworts, *Elodea* and naiad are the most abundant plants in Second and Third Lakes. The white water lily which is abundant in First Lake was repre-

sented in Second Lake by six scattered plants (one of these was a floating rootstalk with four leaves) and in Third Lake by two young plants. None of these in the two lower lakes had blossomed in 1924 as far as could be ascertained. In this case at least, there seems to be something either in the water or the soil of the bottom that has prevented the plant from getting a foothold, as several attempts have been made to transplant mature plants from First Lake to the others. The yellow water lily has succeeded better, as there were nearly a score of plants in Second Lake and eight in Third and in each lake several of the plants were in blossom this year. Other plants that seem especially well fitted for dispersal under the conditions, such as the floating heart with its slender stems with clusters of roots developed a short distance below the leaves, have not been found in either of the lower lakes.

When the level of Little Long Pond was raised, in two places masses of boggy soil broke loose and floated. These floating islands, anchored by the roots of shrubs, are the only places around the lakes where such bog plants as cranberry, round-leaved and intermediate sundew and pitcher plants grow. Their margins are bordered by the water loosestrife, *Decodon verticillata*, the long slender stems dipping into the water where they form a thick growth of spongy, air-holding bark, develop a few floating roots, then rise again into the air. Occasionally this process is repeated a second and even a third time, the plant then consisting of a series of two or three leafy loops separated by submerged portions. This plant also should be easily transported to other parts of the lakes as portions of the root bearing stems are easily broken off and may start new clumps of the plant, but no plants have been found anywhere around the lakes except on the margins of these islands.

Dr. Gilbert Morgan Smith* in discussing the plankton algae of these lakes refers to the much greater algal flora in the Second and Third Lakes. At the time of his investigations these two lakes "bloomed" profusely in August. Dr. Smith suggested that as the vegetable matter submerged when the lakes were formed gradually disappeared by decay and the water assumed a more stable chemical condition and approached the conditions

* Gilbert Morgan Smith, Ecology of the Plankton Algae in the Palisades Interstate Park, Roosevelt Wild Life Bulletin, Vol. 23, No. 4, Feb. 1924.

of Little Long Pond the great number of Blue Green Algae would tend to disappear. This seems to have been already accomplished. The two lakes "bloomed" freely in 1921, slightly in 1922 and not at all in 1923 or 1924. Of course there were floating algae of various kinds in the lakes but nothing approaching the conditions of a "bloom." In the two lower lakes there are a few areas where considerable amounts of *Oscillatoria* are found on the bottom in August but none of this was noticeable in First Lake. If this indicates a decrease in the amount of organic matter in the lake water and an approach to what may be considered the normal composition, it suggests that some plants which have not secured a foothold in these lakes may find suitable conditions in the next few years and become established there. That the nature of the bottom can not be the chief restricting factor is evidenced by the abundant growth on the submerged shores of Little Long Pond.

The plants collected during the past three years are the following:

Plants found in all three lakes

Typha latifolia L., not abundant on any of the shores.

Sparganium eurycarpum Engelm., common on all the lakes.

Potamogeton heterophyllus Schreb. Forma *graminifolius* (Fries) Morong, common in First and Second Lakes, a few widely scattered plants in Third Lake.

Najas flexilis (Willd.) Rostk. & Schmidt. Very common in shallow water.

Elodea canadensis Michx. Common in Second and Third Lakes, formerly common in First Lake.

Vallisneria spiralis L. A few plants in water from two to four feet deep in all lakes.

Eleocharis acicularis (L.) R. & S. Common about the shores and in water up to a foot in depth.

Pontederia cordata L. Common about First Lake, only four plants found on Second and one on Third Lake.

Nymphaea advena Ait. Not uncommon in First Lake, few in the others.

Castalia odorata (Ait.) Woodville & Wood. Common in First, few in Second and only two plants in Third Lake.

Brasenia Schreberi Gmel. Common in First Lake, a few in most parts of Second, common near inlet of Third.

Hypericum virginicum L. Common about the shores of First and Second, uncommon on Third Lake.

Myriophyllum scabratum Michx. Abundant in First Lake, common in the others.

Proserpinaca palustris L. Common about all the lakes.

Utricularia purpurea Walt. Abundant in First Lake, common in Second, a few plants in Third Lake.

U. vulgaris L. Uncommon about all the lakes.

Plants found in First and Second Lakes

Typha angustifolia L. A few plants near shore in both lakes.

Potamogeton natans L. Few plants in First, one only found in Second Lake.

P. zosterifolius Schumacher. Few in First Lake, one plant found near the inlet in Second Lake.

Sagittaria longirostra (M. Michell) J. G. Sm. Not common.

Alisma Plantago-aquatica L. Not common about First Lake, one plant found on Second.

Dulichium arundinaceum (L.) Britton. Few plants.

Peltandra virginica (L.) Kunth. Common about both lakes.

Utricularia subulata L. Uncommon.

Plants found only in First Lake

Equisetum fluviatile L. In marsh bay at end of lake.

Potamogeton dimorphus Raf. Few plants with submerged fruit only.

P. filiformis Pers. Few plants.

P. interruptus L. Not uncommon.

Sagittaria graminea Michx. Few plants, none in flower.

Eleocharis Robbinsii Oakes. In four feet of water near one shore.

Spirodela polyrhiza (L.) Schleid. Common in quiet bays.

Eriocaulon articulatum (Huds.) Morong. Not common in shallow water, sometimes in water eighteen inches deep.

Decodon verticillatus (L.) Ell. On margins of floating islands.

Proserpinaca pectinatus Lam. Few submerged plants.

Nymphoides lacunosum (Vent.) Fernald. Not uncommon in water from six inches to six feet deep.

Myosotis laxa Lehm. In shallows, at end of lake.

Utricularia intermedia Hayne. Floating in company with *myriophyllum* and *U. purpurea*, no flowers found.

New York City.

SOME EXTINCT OR LOST AND REDISCOVERED PLANTS—I.

While engaged in his taxonomic work on the Pea Family, the writer came across two species, which evidently have become extinct during the last century and a few which were lost but have been rediscovered. The thought struck him that other botanists might be interested in extinct and lost species, and he has therefore planned to present some notes that might call attention to such species and lead to the rediscovery of some of these so-called lost species or the establishment of the fact that they actually have become extinct within historic times.

Astragalus Robbinsii (Oakes) A. Gray

This species was described as *Phaca Robbinsii* in Magazine of Horticulture edited by Hovey (**7**: 181, 1841). It had been discovered in 1829 by Dr. Robbins, after whom it was named. Oakes gives the type locality as follows: "On rocky ledges, overflowing in the spring, on the banks of the Onion River, Burlington, Vermont." In Zadock Thompson's History of Vermont there is given a list of plants of Vermont (p. 183, 1842, and reprinted in 1853), also prepared by Oakes, in which the type locality is given more definitely: "On a limestone ledge in Burlington, on the banks of Winooski River, a quarter of a mile below High Bridge, *Robbins*." As far as the writer can find this is the only locality in which the species has been found and as far as can be ascertained the type station is now destroyed. It may be of interest to trace out its history.

In the first edition of his manual (p. 103, 1848), Dr. Gray gave the distribution of the species as: "Rocky ledges of the Onion River, near Burlington, Vermont." In the second edition (p. 98, 1856), the plant appears as *Astragalus Robbinsii* A. Gray, but the distribution remained unchanged, with the addition: "Willoughby Mountain, *Mr. Blake*." This specimen of Mr. Blake, however, belongs to a closely related species, *Astragalus Blakei* Eggleston.

In the third edition (p. 98, 1862), the Willoughby locality is omitted, and in the Addenda (p. xci), Blake's specimens are referred to as a form of *Astragalus alpinus*. This treatment remained unchanged in the fourth edition (1863 and 1864).

In the fifth edition (p. 133, 1867–1880) the distribution is given as: "Rocky ledges of Onion River, at Colchester, Vermont. *Dr. Robbins* (1829): the station now obliterated." The type locality is, as far as the writer has been able to ascertain, near Burlington, but within the town of Colchester, several miles, however, from the railroad station of the latter name. The statement "now obliterated," however, was apparently then premature, for the plant has been collected later than 1867 and 1880.

In the sixth edition, the distribution given (p. 136, 1890) is modified and reads simply: "Rocky ledges, Vt." This would indicate that other localities might have been found in the meantime, but I can find no evidence to that effect.

In the new Gray's Manual (p. 516, 1908) edited by Robinson and Fernald, the distribution is again thus restricted: "Rocky Ledges of the Winooski R., Vt. (station now extinct)." As Onion River and the Winooski are the same, the distribution given is identical with that in the fifth edition of Gray's Manual, and was at this time evidently according to facts.

This is in short the history of the plant as given in the several editions of our oldest manual of the Northeastern United States. Let us, however, see what light other publications show on the subject.

In Wood's Classbook (p. 229) at least between 1851 and 1856, the distribution is copied from the first edition of Gray's Manual. In the later editions (p. 318) from 1863–1881, it was given as: "Ledges by rivers and lakes, northern Vt., rare," and in the Botanist and Florist (p. 94, 1889) as "Rocky shores, Vt." In all cases very indefinite.

In Archives of Science for Jan.–Apr., 1873, Perkins also adds to the distribution: "It has also been found by Mr. C. C. Frost on the Willoughby Mountain, &c." These specimens belong to *A. Blakei.*

In Perkins' Catalogue of the Flora of Vermont (p. 19, 1888) I find: "Near Burlington; also Hartland, and near Hanover, N. H." The last two localities refer to *A. Jesupi.*

In Britton & Brown's Illustrated Flora, first edition (**2**: 304, 1897), the authors gave the distribution as Vermont and New Hampshire, but they included in it also *A. Jesupi* and probably *A. Blakei.* Dr. Britton in his Manual, in both editions

(p. 553, 1901 and 1907), gives the same distribution, though in the appendix of the second edition, he admits *A. Jesupi* as a species. In the second edition of the Illustrated Flora (**2**: 381, 1913), the distribution is corrected, reading: "Known only from rocky ledges of the Winooski River, Vermont, station now obliterated and the species extinct, unless inhabiting some undiscovered locality."

In the Flora of Vermont by Brainerd, Jones and Eggleston (p. 54, 1900), the following remarks are found: "On limestone rocks, near High Bridge, Winooski River, Burlington. This, the only station in Vermont,[1] was destroyed in 1894 by the set back of the dam of the Vermont Electric Power Company." This was repeated verbatim in Eggleston, Kirk and Underwood's Flora of Vermont (Vermont Agr. Exp. Sta. Bull. **187**: 217, 1915).

In her Flora of Burlington and Vicinity, Nellie F. Flynn (p. 53, 1911) made a similar statement: "On limestone rocks, Winooski Gorge (Robbins). This, the only known station in Vermont, was destroyed in 1894 when the new dam flooded the rocks."

The writer takes the liberty to cite the following from a letter received from Mr. Eggleston. "The statement in the two editions of the Vermont Flora and Mrs. Flynn's Flora covers the situation of *Astragalus Robbinsii*." "L. R. Jones with his students searched carefully for other localities and found none." "C. G. Pringle rediscovered the station some time in the seventies and he knew only the locality in the base of Colchester Gorge, where Jones and I collected it later. Wrong interpretations of the labels of earlier collections are to blame for the idea that *Astragalus Robbinsii* was found outside the gorge."

The history of the plant may also be traced from specimens in herbaria. My research in this line has been limited to the herbaria of The New York Botanical Garden, Columbia University, Harvard University, and the New England Botanical Club. I have written to the University of Vermont at Burlington during the summer vacation but have not yet received any answer. All specimens of the true *Phaca* or *Astragalus Robbinsii* seen are labelled, "Near Burlington," "Colchester," "High

[1] They could just as well have left out the words "in Vermont," for it has never been found elsewhere.

Bridge," or "on Winooski River," which all practically mean the type locality or very near to it, and probably were included in the flooded area. The collections contained specimens gathered by the following botanists: *Robbins*, in 1829; *Oakes* and *Cary* in 1841; *Pringle* in 1875, 1877, and 1878; *Brainerd* in 1878; *Grout* in 1891, and *Jones & Eggleston* in 1893. I have seen no specimens collected after 1894.

As stated before, the original record of specimens collected on Willoughby Mountain by Blake was erroneous, for the specimens do not belong to *A. Robbinsii.* Gray noticed the error but made another error in referring it to *A. alpinus.* Eggleston in 1895 described a new species *A. Blakei*, including among others Blake's specimens and naming it after that collector. Even since this species was described, many have mistaken the two. While visiting the Gray Herbarium last year the visitor forgot to consult the collection of the New England Botanical Club, and therefore sent in an inquiry. Miss Sanderson, librarian of the Gray Herbarium, kindly informed me that there were two sheets in the New England Botanical Club herbarium, labelled *A. Robbinsii*, collected by Churchill in 1897. She also sent these to the writer. They turned out to be, as was suspected, *A. Blakei.* The latter has been collected by quite a number of persons at different stations in the Willoughby Mountain region, and also on St. John's River in Maine by Miss Furbish and in Labrador by S. R. Butler.

As to the Hartland, Vt., and Hanover, N. H., stations, mentioned in Perkins' Catalogue, they refer to Jesup's specimens, which, together with Eggleston's own, became the basis for *A. Jesupi* (Eggleston & Sheldon) Britton. The latter is a closely related and very local species. To the two localities mentioned above should be added, Summers Falls, Plainfield, N. H., all three in the Connecticut River Valley.

From the preceding may be concluded that as far as we know *Astragalus Robbinsii* has become extinct and by the action of man. If any botanist should find the plant or has any record of having found it outside of the destroyed area, or since 1894, it would be of general interest if made known.

P. A. RYDBERG

SHORTER ARTICLES

The Fringed Gentian.—*Gentiana crinita* Froel.—Much has been written about this beautiful but elusive American wild flower, and information about its life history and peculiar habits and habitats is being acquired, so that it will be possible to cultivate it and bring it back to the places where it used to be native and abundant. It has been well-established that it is a biennial and there seems to be some ground for the statement that it thrives best where there is lime in the soil, and sufficient moisture so that the seedlings do not become too dry. It has also been definitely shown that early frosts often kill the plants before they can scatter seeds, so that it disappears or becomes scarce for several seasons, but if a few plants remain to form seed, it will reappear in the same locality after a year or two of absence. It ranges from Quebec to Georgia along the Atlantic coastal plain and westward to Minnesota and Iowa in the Mississippi Valley, and grows in wet meadows on the borders of streams and lakes where the soil is moist but not too wet or swampy.

Perhaps the most successful replanting has been done by Dr. George F. Norton of Pleasantville, N. Y. In October, 1906, he collected seeds near Stanwich, Conn. and sowed them at once near his home in Westchester County. Some of the seed he kept over the winter but has reason to believe that the fresh seed germinates more readily. Having established the plant near his home, he has continued to plant it in different places from Bedford Hills to Valhalla and from Danbury, Conn. to the Hudson and distributed seeds to many other places.

Mrs. Caspar T. Sharpless of Camden, N. J. has established it at her summer home near Mt. Pocono, Penn. and grown plants three feet high with over 100 blossoms. Miss E. R. Kennaday of Mendham, N. J. has sown seed in Bergen Co., N. J. and Dutchess Co., N. Y. The former director of the Buffalo Botanic Garden—John F. Cowell—had grown fringed gentian successfully for six years and sent some to the N. Y. Botanical Garden. We have tried growing it in pots and sowing it braodcast in favorable localities. The plants sown in pots quickly become pot-bound, and when transplanted, the roots are injured so that the plants are stunted and rarely grow

more than a rosette of leaves. So it seems definitely proven that the only way to have fringed gentians is to sow them in favorable spots where they will not be trampled, cut off or carried away. And it is particularly to be desired that the earliest blossoms be left to form seed, as the later ones may be nipped by frost and fail to do so.

ELIZABETH G. BRITTON
NEW YORK BOTANICAL GARDEN.

SOME OBSERVATIONS ON LONICERA JAPONICA THUNB. (JAPANESE HONEYSUCKLE)

The great variety of color and the fragrance of blossoms are, doubtless, responsible for most people's interest in plants. But in spite of the variety, the color of a given blossom usually remains the same throughout its life and those most highly colored often lack fragrance. So a fragrant blossom which turns from white to pale yellow and then to deeper shades is of special interest.

How long does this color change in *Lonicera japonica* take? Does the time vary and if so, what makes it vary? To try to answer these questions, observations were made on 42 blossoms in 13 groups of 2, 3, or 4 blossoms each. The plant on which they grew was about fifteen feet high, growing against a dead tree. For the lower five feet it spread to a width of about 10 feet. Observations extended over a period of six days and were made at first approximately at 7:45 A.M., 1:45 and 7:45 P.M. There was practically no rainfall during this period and the temperature varied from 67 to 82 degrees Fahrenheit indoors.

No changes occurred from 7:45 P.M. to 7:45 A.M., few changes occurred from 7:45 A.M. to 1:45 P.M., most changes occurred from 1:45 to 7:45 P.M. Blossoms that opened one afternoon turned pale yellow the next. In only one case was there a change from white to yellow in the morning, but once having turned yellow they often turned to darker shades of yellow in the morning.

It was found that the time in which the blossoms change from white to deepest yellow varies, being shorter when the temperature is higher.

No. of blossoms	Time required for change	Highest temperature	Lowest temperature	Average temperature
4	48 hours	82	73	75
8	66 "	82	71	75
2	66 "	76	67	73
28	72 "	76	67	73

All temperature readings were made indoors.

Observations were made at Cold Spring Harbor from July 25 to 30, 1924.

Emma L. Kemp

Lincoln High School,
Jersey City, N. J.

PROCEEDINGS OF THE CLUB

Meeting of May 28, 1924

On this date a joint all-day meeting of the Club and several other societies and individuals interested in the conservation of our native wild plants was held at the Brooklyn Botanic Garden.

The following were elected to membership in the Club at this meeting:

Mr. Edward J. Alexander, 664 West 179th Street, N. Y. City.

Mr. John E. F. Hellawell, 362 Dean Street, Brooklyn.

Mr. Roland Jackson Hunter, 636 High St., Newark, N. J.

Mr. William H. Zaun, Jersey City, N. J.

In the morning Miss Ellen Eddy Shaw spoke on the work of her department in the Children's Gardens. After her lecture in the Laboratory Building, the visitors were conducted to the Children's Gardens in the southern part of the Garden, where Miss Shaw explained the methods of instruction.

In the afternoon the report was received of the Committee on Conservation of Native Plants appointed last May at a similar meeting at the Garden. The committee appointed at that time was as follows: Dr. R. C. Benedict, of the Brooklyn Botanic Garden, Chairman, representing the American Fern Society; Dr. G. Clyde Fisher, of the American Museum of Natural History, from the New York Bird and Tree Club; Dr. Homer D. House, of the New York State Museum, from the Wild Flower Preservation Society of America; and Dr. M. A. Howe, of the New York Botanical Garden, from the Torrey Botanical Club, and also Attorney Augustus O. Bourne, Jr.

In his report, Dr. Benedict stated that for the present the most practicable way to gain legal protection seemed to be the insertion of the word "Plants" in the Private Parks section of the State Conservation law. This amendment has been passed by the New York State Senate, but not by the Assembly. Dr. Homer D. House, New York State Botanist, also spoke in favor of legislation and showed lantern slides of some of the species needing protection.

In the general discussion which followed the consensus of opinion was that the most effective way to create popular sentiment in favor of plant conservation is through education, particularly by instruction of the children in the elementary and secondary schools. Mrs. Francke, of the North Country Garden Club, Long Island, reported that placards placed along the roads in the north shore region of Long Island asking passersby to spare the dogwood, had evidently been respected and had produced a very favorable result.

Dr. Benedict stated that the most practicable present method by which our native wild plants can be saved is through initiative of private individuals who will take steps to establish small sanctuaries or private parks where the chief emphasis is on the protection of wild flowers and their propagation with a view to reestablishing them in wider areas. The question of wild plant propagation should make a fascinating hobby, and many species are not difficult of reproduction, as has already been demonstrated. For example, it has been proved to be perfectly feasible to reestablish the fringed gentian merely by scattering carefully collected seeds.

The committee was reelected for the ensuing year and increased by the following members: Mrs. E. G. Britton, Honorary Curator, New York Botanical Garden; Mrs. Francke, representing the Long Island zone of the Garden Clubs of America; and Dr. Arthur H. Graves, Curator of Public Instruction, Brooklyn Botanic Garden.

On the resignation of Dr. Benedict from the chairmanship, Dr. G. Clyde Fisher was appointed chairman for the ensuing year.

The following organizations were invited to send official delegates to this meeting: Brooklyn Botanic Garden, New York Botanical Garden, Federated Garden Clubs of New York State,

National Plant, Flower and Fruit Guild, American Scenic and Historic Preservation Society, Horticultural Society of New York.

ARTHUR H. GRAVES,
Secretary.

MEETING OF OCTOBER 14, 1924

The meeting was held at the American Museum of Natural History.

The resignation of Dr. W. A. Murrill was accepted with regret.

The following were elected to membership:

Mr. S. T. Marcus, 260 West 36th St., New York.

Miss Norine W. Boetsch, 29 Bronx River Rd., Yonkers, N. Y.

Mr. Walter J. Himmell, State Univ. of Iowa, Iowa City, Ia.

Miss Gertrude M. Felke, 1761 Topping Ave., New York.

Miss Johanna Oppenheimer, 191 Claremont Ave., New York.

Miss Caroline Halsted, 400 West 151st St., New York.

Professor Richards announced the resignation of Dr. Denslow as Editor of the Torrey Bulletin and the appointment by the chair of Dr. T. E. Hazen as Editor. On the motion of Professor Harper this appointment was duly ratified by the Club.

Dr. Harper spoke briefly on the August meeting of the British Association for the Advancement of Science at Toronto. He reported the finding of an albino form of *Verbena hastata* of which he brought back seed. One of the most enthusiastic discussions at the British meeting centered about the nature of sap flow. Dr. Dixon believed that both the upward and downward flow occurs in the xylem and is a staunch advocate of the cohesion theory. Dr. Curtis concluded that both upward and downward flow of the sap occur in the phloem.

Dr. Harper also reported finding *Ustilago violacea*, the anther smut, on *Silene caroliniana*, a southern form of the species about here (*S. pennsylvanica*) and growing near Washington, D. C. This fungus is particularly interesting in view of researches of Dr. B. O. Dodge, soon to be published.

Dr. Gager reported the finding, on a small island in Belgrade Lake, Maine, of a vigorous colony of *Marchantia polymorpha* three yards wide by four yards long, covered plentifully with the tiny umbrella-like structures, both male and female. Dr. Levine stated that formerly great patches of this hepatic existed in the Bear Mountain region.

Dr. Howe reported the collection, by Dr. W. R. Taylor, of about 230 species of algae from the vicinity of the Dry Tortugas near Key West. Dr. Swingle also sent in some interesting species of fossil calcareous algae from the Salton Sea region during the summer.

Dr. Graves reported the finding by Mr. Norman Taylor, during the summer, of *Empetrum nigrum* at Montauk, Long Island. The abundance of the Post Oak, *Quercus stellata*, and occurrence of the Chestnut Oak, *Q. prinus*, on Hunter's Island were also noted. The secretary also spoke of an interesting region for botanizing, located at the base of the Palisades about opposite 150th St. on an area of flat land jutting out into the Hudson where ballast plants are plentiful.

Dr. Gager reported a large tree Lilac (*Syringa japonica* ?) at Kiseena Park, Flushing, also *Cornus Kousa* with an abundance of fruit, and recommended the region for a future field trip of the Club.

Dr. Levine stated that he had obtained good material of Russula near Ithaca during the summer, suitable for sectioning for further work in the development of the Hymenomycetes.

Mr. Hastings showed interesting sheets of plants collected near Grassy Sprain Reservoir, Yonkers. Variation in size, shown on each sheet, was caused by the submergence of some of the seeds for shorter or longer periods, delaying their germination, and thus shortening the period to flowering.

Dr. Hazen spent most of the summer at Woods Hole and reported the successful cultivation of unicellular algae. He also noted the sporadic occurrence of *Polystichum Braunii* along the Monroe Sky-line Trail in the Green Mountains.

ARTHUR H. GRAVES,
Secretary.

DATES OF PUBLICATION OF TORREYA

No. 1.	Jan.–Feb.	Pages	1–16	Issued	25 Feb. 1924
No. 2.	Mar.–Apr.	"	17–38	"	30 Apr. 1924
No. 3.	May–June	"	39–54	"	25 June 1924
No. 4.	July–Aug.	"	55–70	"	21 Aug. 1924
No. 5.	Sept.–Oct.	"	71–90	"	28 Oct. 1924
No. 6.	Nov.–Dec.	"	91–114	"	31 Dec. 1924

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(The names of species and varieties described as new are in **bold faced type**.)

The Torrey Botanical Club

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A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

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TORREYA

A BI-MONTHLY JOURNAL OF BOTANICAL NOTES AND NEWS

John Torrey, 1796–1873

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

VOLUME 25

NEW YORK
1925

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THE TORREY BOTANICAL CLUB

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GEORGE T. HASTINGS
2567 Sedgwick Ave.
New York City.

TORREYA

Vol. 25 No. 1

January-February, 1925

SOME TREE BUDS

George T. Hastings

For winter field study the botanist finds nothing to equal in interest the buds of trees and shrubs. To aid in such study there are numerous keys to the trees in winter, based on the buds, leaf scars and twig characters, those found in Brown's Trees of New York State and Jarvis and Blakeslee's New England Trees in Winter being among the most accessible. Some difficulty may be found in using these keys if twigs are taken from lower limbs where growth has been slow. Such twigs are more slender, the buds are small, usually with fewer scales than those on more vigorously growing twigs.

Of trees with opposite leaves and hence opposite buds the maples, horse-chestnut, ashes and flowering dogwood are the only ones native in our region. In all of these the buds are protected by scales formed of modified leaves. The short pointed buds of the ashes with two pairs of dark scales are very distinct from the oval buds with four or more pairs of gray, red or brown scales of the maples. The striped maple and the ash-leaved maple or box elder have but a single pair of bud scales. In the latter case the rounded, short-stalked buds are unlike those of any other tree. In the lateral buds of the ashes the single pair of scales join so closely on the edges that it is often difficult to see that there are any scales at all. In the red and silver maples the rounded flower buds at the sides of the narrow leaf buds are a reminder that these will be among the first flowers of spring. Often these flower buds, especially in the silver maple, are densely crowded, eight at a node with the two leaf buds making a complete ring of buds around the stem. But lower branches and young trees will usually have no flower buds. The buds of the flowering dogwood are of special interest. Many branches bear the broad flower buds at their tips. These buds have two pairs of bud scales which in the spring will grow out from their bases into the four large petal-like bracts that

make the conspicuous part of the dogwood "flower," the dry reddish winter scale forming an irregular tip to the white "petals." Below the flower bud are four leaf buds pressed against the stem, each covered by a single scale. As the flower bud develops, these grow out at right angles to each other (often only two of the buds develop). The leaf buds of the dogwood are to be found only at the tips of the stems, the pair of leaf scars in the middle of each year's growth bearing no buds above them. The terminal buds are partly surrounded by the bases of the petioles of last year's leaves. Between each of these petioles and the bud a tiny leaf bud is hidden. The two bud scales enclose three small buds, two lateral and one terminal, each consisting of a single pair of leaves with a growing point between. The tips of the twigs thus have five leaf buds, though only one is apparent. Sometimes all four of the lateral buds develop, sometimes only part of them, but they usually grow longer than the terminal one, making the branching irregular and spreading.

Of trees with alternate buds a few have no protecting scales. In the black locust the buds are submerged in the stem below the leaf scars. On young or vigorous shoots there is a pair of stout spines at each side of the leaf scar, these remaining on the stem for several years, but on older trees, especially on the lower branches, the spines are too small to be seen or may be entirely lacking. The leaf scar is three-lobed with three bundle scars. After the leaf falls the scar cracks between the bundles, exposing a cavity lined with silky brown hairs. These hairs grow downward from the scar that forms the roof of the chamber, as well as up from the bottom. On the median line among these hairs are from two to four almost microscopic buds, mere projections without evidence of leaves as seen with a hand lens. Often another bud is formed beneath the bark just above the leaf scar, showing as a slight ridge. This bud sometimes develops into a short shoot the first year, but in such cases nearly always dies and drops off before winter. No terminal bud is found in the locust, but as the tip of the twig dies and breaks off immediately above the last lateral bud, this usually appears terminal.

Bud scales when present may represent leaves as in the oaks, hickories and others, or they may be stipules. In the oaks

several buds are clustered at the end of the twigs, the overlapping scales are in five rows and very numerous, three or four times as many leaves being used as scales to protect the bud as will develop as foliage leaves from the bud. In the tulip-tree the bud is covered by the stipules belonging to the last leaf of the preceding season. Inside these is a small leaf folded down the midrib, then doubled over against the stem, its stipules much larger than the leaf; these cover the next leaf whose stipules, in turn cover the succeeding leaf. The first leaf, sometimes the second also, is dead, the others will all open in the spring when the stipules spread apart. The long slender buds of the beech covered by twenty or more shining chestnut scales, each larger than the preceding, will keep the scales for some time as the bud opens in the spring, the inner ones covering the young leaves after the bud has grown to three inches in leegth.

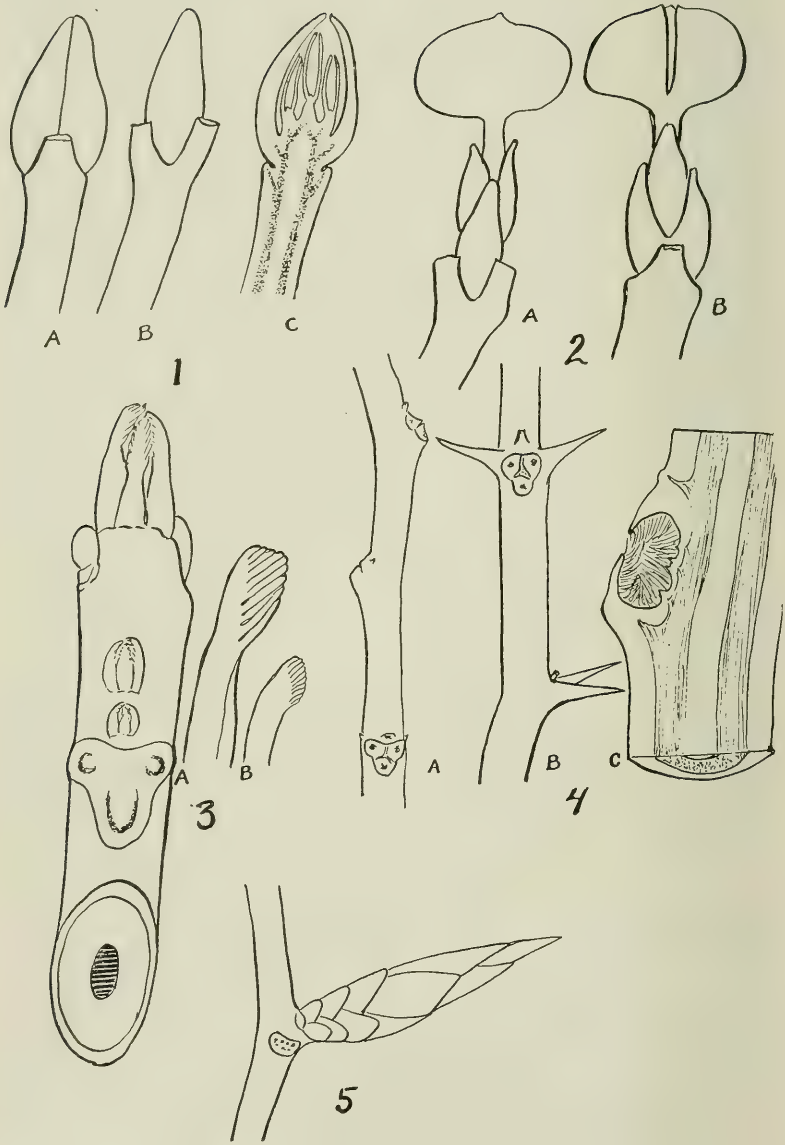
In the case of the walnut, butternut and bitternut, no scales are formed, but the young leaves, thick and covered with down in the walnut and butternut, thinner and dotted with yellow resin in the bitternut, are crowded together in an unprotected bud. The petioles are larger than the closely folded leaflets, the outer leaves showing eight or nine pairs of leaflets, the inner and smaller ones more.

Most trees with definite growth have all the leaves of the next season already formed in the bud. This can be readily seen in the tulip-tree and maples by counting the number of leaf scars on the year's growth, then dissecting the bud and counting the young leaves hidden there.

Explanation of plate

FIG. 1. A and B. Leaf buds of Flowering Dogwood.
C. Long. sect. of same, slightly diagrammatic.
FIG. 2. Flower buds of Dogwood.
FIG. 3. A. Butternut twig and bud.
B. One outer and one inner leaf from the bud.
FIG. 4. A. Twig of Black Locust with almost invisible thorns.
B. Twig of Locust with thorns, remains of small branchlets above leaf scars.
C. Long. sect. through twig showing buds under leaf scar.
FIG. 5. Bud of Beech.

NEW YORK.


A
B
C
1
A
2
B
A
3
B
A
B
C
4
5

UNREPORTED PLANTS FROM LONG ISLAND, N. Y.

II. Cryptogams Exclusive of Pteridophyta*

N. M. Grier

An earlier paper, (Torreya 24, No. 5) dealt with the vascular plants which appear to have been unreported from Long Island. The present list is concerned with those native plant groups which have by no means received an equivalent amount of systematic study. In addition to papers by Jelliffe (1893–1904), Grout, (1902), Gurnham and Latham (1914–24), and the more occasional mention of these forms by authors cited in connection with the previous list, the species now given have been checked with the lists of Farlow (1882–1893), Britton (1884), Reichling (1905), Wood (1905–14), Howe (1914) and Evans (1923), for Long Island and adjacent regions. The nomenclature used is that of the authorities mentioned in connection with each group, although the background of the classification is essentially that of the recent edition of the Engler and Prantl "Syllabus der Pflanzenfamilien." The workers whose data besides those of the writer are presented in the following list are:

Professor L. N. Johnson, formerly of the University of Michigan. L. N. J.

Professor D. S. Johnson, Johns Hopkins University. D. S. J.

Dr. H. H. York, New York State Conservation Commission, Albany, N. Y. H. H. Y.

Dr. A. F. Blakeslee, Carnegie Institution of Washington, Cold Spring Harbor, N. Y. A. F. B.

Dr. G. Clyde Fisher, American Museum of Natural History. G. C. F.

Miss Miriam A. Bomhard, University of Pittsburgh. M. A. B.

Professor E. N. Transeau, Ohio State University. E. N. T.

Professor Susan Green, Maryville College. S. A. G.

Professor O. E. Jennings, University of Pittsburgh. O. E. J.

Miss Gail H. Holliday, Wheeling High School. G. H. H.

* Contribution No. 7 from the Biological Laboratory, Cold Spring Harbor, N. Y.

SCHIZOPHYTA†

CHAMAESIPHONACEAE

Chamaesiphon sp. Epiphytic on *Cladophora* sp., C. S. H. D. S. J.

CHROOCOCCACEAE

Calothrix confervicola Ag. On *Cladophora* in tide pools, Lloyd's Point, L. I. N. M. G.

Calothrix crustacea (Schousb.) Born. & Thuret. On grasses and algae at Eatons Point, L. I.

Calothrix parasitica (Chauv.) Thuret. Common on *Nemalion* sp., C. S. H. D. S. J.

Calothrix pulvinata Ag. Growing on tufts of *Spartina patens.* D. S. J.

Calothrix scopulorum (Web. & Mohr) Ag. On posts under old mill, C. S. H. D. S. J.

Chroococcus turgidus (Kuetz) Naeg. On *Spartina*, stubble, inner harbor, C. S. H. D. S. J. H. H. Y.

Dactylococopsis rhaphidioides Hansg. Common in Jarvis Pond, C. S. H. N. M. G.

NOSTOCACEAE

Anabaena torulosa (Carm.) Lagerh. Estuary north of cement bridge, C. S. H. N. M. G.

Anabaena variabilis Kuetz. West side, inner harbor, C. S. H. D. S. J.

Cylindrospermum majus Kuetz. Bottom of Jarvis Pond, C. S. H. N. M. G.

OSCILLATORIACEAE

Lyngbya confervoides Ag. On mud in outlet from Fishery Ponds, C. S. H. D. S. J.

Lyngbya semiplena (Ag.) J. Ag. Mud and tangles about *Spartina.* D. S. J. and H. H. Y.

Microcoleus tenerrimus Gomont. Algal mats on marsh. D. S. J. and H. H. Y.

Oscillatoria gracilima Vauch. Common. Jarvis Pond, C. S. H. N. M. G.

Oscillatoria formosa Bory. Floating in Fish Hatchery Pool, C. S. H. N. M. G.

Oscillatoria ornata Kuetz. Forming bright green mats in 1st lake, C. S. H. D. S. J.

Phormidium laminosum (Ag.) Gom. Jarvis Pond, C. S. H. N. M. G.

Oscillatoria animalis Ag. Forming mats, 1st lake. N. M. G.

RIVULARIACEAE

Rivularia nitida Ag. N. and E. shore, C. S. H. D. S. J.

† Schizophyceae revised following the terminology of "The Myxophyceae of N. America and Adjacent Regions" Minnesota Algae. Vol. I. Josephine Tilden. Report of Survey, Botanical Series **VIII. V.** of Minnesota, 1910.

MYXOMYCETES†

CERATOMYXACEAE

Ceratiomyxa poriodes (Alb. & Schw.) Schroeter. On stump near falls, 1st lake, C. S. H. N. M. G.

CLATHROPTYCHIACEAE

Dictydium cancellatum (Batsch) Macb. Abundant on dead wood, C. S. H. N. M. G.

DICTYOSTELIACEAE

Dictyostelium mucoroides Brefeld. On muskrat dung, C. S. H. D. S. J.

DIDYMIACEAE

Diderma testaceum (Schrad.) Rost On dead leaves near 1st lake, C. S. H. D. S. J.

LICEACEAE

Tubulina ferruginosa (Batsch) Macb. Abundant on dead wood, C. S. H. D. S. J.

PHYSARACEAE

Badhamia decipiens (Curt.) Berk. On dead oak leaves west of 2nd lake, C. S. H. N. M. G.

Leocarpus fragilis (Dicks.) Rost. Occasional on mosses and dead leaves in vicinity of school house, C. S. H. N. M. G.

Physarum compressum Alb. & Schw. On dead twigs, C. S. H. N. M. G.

PLASMODIOPHORACEAE

Hemitrichia clavata (Pers.) Rost. Frequent on wood, C. S. H. D. S. J.

RETICULARIACEAE

Tubifera ferruginosa (Batsch) Macb. On old stumps, C. S. H. M. A. B.

STEMONITACEAE

Comatricha typhoides (Bull.) Rost. On old logs, vicinity of lakes. M. A. B.

TRICHIACEAE

Lachnobolus globosus (Schw.) Rost. Frequent on rotten wood, C. S. H. D. S. J.

Arcyria incarnata Pers. On rotten wood, C. S. H. D. S. J.

† Revised following the terminology given in North American Slime Molds, New and Revised Edition. T. H. Macbride, Macmillan and Company, 1922.

BACILLARIOPHYTA (Diatoms)*

FRAGILAROIDEAE

Diatoma vulgare Bory. Common, Jarvis Pond, C. S. H. N. M. G.
Fragilaria virescens Ralfs. Common, Jarvis Pond, C. S. H. N. M. G.
Synedra radians Kuetz. Common, Jarvis Pond, C. S. H. N. M. G.

NAVICULOIDEAE

Amphipleura sp. N. M. G.
Navicula Grevillei Ag. On Zostera, C. S. H. N. M. G.
Neidium affine (Ehrenb.) Pfitzer. Common, Jarvis Pond, C. S. H. N. M. G.
Pleurosigma distortum W. Sm. On mud and pebbles, C. S. H. D. S. J.

CONJUGATAE**

MESOTAENIACEAE

Bambusina Brebissonii Kuetz. 2nd lake, C. S. H. L. N. J.
Closterium didymotocum Corda. 2nd lake, C. S. H. N. M. G.

DESMIDIACEAE

Arthrodesmus convergens Ehrenb. Common, Jarvis Pond, C. S. H. L. N. J.
Arthrodesmus fragilis Wolle. Common, Jarvis Pond, C. S. H. L. N. J.
Cosmarium everettense Wolle. Common, Jarvis Pond, C. S. H. L. N. J.
Cosmarium ornatum Ralfs. Common, Jarvis Pond, C. S. H. N. M. G.
Cosmarium ovale Ralfs. Common, Jarvis Pond, C. S. H. L. N. J.
Cosmarium tetraophthalmum (Kuetz.) Bréb. Common, Jarvis Pond, C. S. H. L. N. J.
Euastrum verrucosum (Ehrenb.) Ralfs. Common, Jarvis Pond, C. S. H. L. N. J.
Micrasterias radiata Hass. Common, Jarvis Pond, C. S. H. L. N. J.
Micrasterias laticeps Nordst. Common, Jarvis Pond, C. S. H. N. M. G.
Micrasterias muricata Bailey. Common, Jarvis Pond, C. S. H. L. N. J.
Netrium Digitus (Ehrenb.) Itzig. & Rothe. Common, Jarvis Pond, C. S. H. N. M. G.
Spondylosium tetragonum West. Common, Jarvis Pond, C. S. H. L. N. J.
Staurastrum gracile Ralfs. Jarvis Pond, C. S. H. L. N. J.
Staurastrum pentacladium Wolle. Jarvis Pond, C. S. H. L. N. J.
Staurastrum tohopekaligense Wolle. Jarvis Pond, C. S. H. L. N. J.
Staurastrum vestitum Ralfs. Jarvis Pond, C. S. H. L. N. J.

* Revised according to Van Huerck's Treatise on the Diatomaceae with some reference to The Diatomaceae of Philadelphia and Vicinity. C. S. Boyer, Philadelphia, 1916. J. B. Lippincott Company.

** Revised following principally the nomenclature given in British Desmidiaceae Vol. I–IV. W. West and G. S. West, Vol. V. Nellie Carter, London, 1904, 1905, 1908, 1912, and 1923. Published by the Ray Society.

ZYGNEMATACEAE

Spirogyra majuscula Kuetz. 2nd lake, C. S. H. L. N. J.
Spirogyra mirabilis (Hass.) Kuetz. 2nd lake, C. S. H. L. N. J.
Zygnema stellinum (Vauch.) Ag. 2nd lake, C. S. H. L. N. J.

CHLOROPHYCEAE*

CLADOPHORACEAE

Rhizoclonium riparium (Roth) Harvey. On stones, algal mats; on *Spartina*, C. S. H. H. H. Y.
Cladophora fracta (Dillw.) Kuetz. Shoals at inner end, Center Island. E. C. F.

CHAETOPHORACEAE

Draparnaldia plumosa (Vauch.) Ag. Fish Hatchery Pond. E. N. T.

COELASTRACEAE

Scenedesmus obliquus (Turp.) Kuetz. 2nd lake, C. S. H. N. M. G.
Scenedesmus quadricauda (Turp.) Bréb. 2nd lake, C. S. H. N. M. G.

OEDOGONIACEAE

Oedogonium crassiusculum var. *idioandrosporum* Wittr. & Nordst. Dying Pond, C. S. H. E. N. T.
Oedogonium grande Kuetz. Fish Hatchery Pond. E. N. T.
Oedogonium Pringsheimii Cram. On *Ceratophyllum*, 1st lake, C. S. H. D. S. J.
Oedogonium rufescens var. *exiguum* Wittr. Dying Pond, C. S. H. E. N. T.

PROTOCOCCACEAE

Palmellococcus miniatus (Leib.) Chodat. C. S. H. N. M. G.
Zoochlorella parasitica Brandt. On fresh water sponge in Dying Pond. E. N. T.

ULVACEAE

Enteromorpha prolifera (Fl. Dan.) J. Ag. Estuary, C. S. H. D. S. J.
Ilea fulvescens (Ag.) J. Ag. Estuary, C. S. H. N. M. G.
Monostroma crepidinum Farl. Estuary, C. S. H. D. S. J.

VALONIACEAE

Dictyocystis Hitchcockii (Wolle) Lag. Common, bottom 2nd lake, C. S. H. N. M. G.

VOLVOCACEAE

Volvox aureus Ehr. Ponds, C. S. H. E. N. T.

* Revised according to "The Green Algae of N. America" F. S. Collins. Tufts College Studies (Scientific Series) Vol. 2, No. 3. Vol. 3, No. 2; Vol. 4, No. 7. Tufts College, Mass.

PHAEOPHYCEAE*

FUCACEAE

Fucus platycarpus Thuret. On stones, piles, docks, C. S. H. D. S. J.

RALFSIACEAE

Ralfsia clavata (Carm.) Farlow. Piles, wharves, inner harbor. D. S. J. and H. H. Y.

RHODOPHYCEAE

CERAMIACEAE

Ceramium rubrum var. *proliferum* Harvey. Eatons Point, L. I. N. M. G.

SQUAMARIACEAE

Petrocelis cruenta J. Ag. Inner harbor. Tidal Inlet. D. S. J. and H. H. Y.

(*To be continued*)

DARTMOUTH COLLEGE.

FURTHER NOTES ON WOODY PLANTS

W. W. ASHE

Vaccinium vacillans Missouriense, var. nov.—The size and habit of the type; twigs and stems green, red or reddish-brown, terete; branchlets soft pubescent, the pubescence persistent until the second year. Leaves dark green, thick, with entire, revolute or thickened margins; oblong or oblanceolate, 3–5 cm. long, 1–1.7 cm. wide, acute at both ends; soon glabrous above except on the veins, permanently soft pubescent beneath, the midrib often arcuate and the leaf oblique. Flowers unknown. Fruit often merely glaucescent or sometimes black, but usually like that of the type. The most distinct variety of this variable species and possibly if the flowers should show differences entitled to be regarded as a species.—Monteer, Mo. W. W. A.

Vaccinium virgatum Ozarkense, var. nov.—Branchlets green or reddish, angled, the first season finely pubescent. Leaves oblong 2.5–4.2 cm. long, 9–1.6 cm. wide, acute or acuminate at apex, acute at base; margin entire, sometimes finely ciliate, puberulent above on midrib, bright green on both sides, thin, reticulate-veined below, and more or less pubescent. Flowers small, 5–6 mm. long, short cylindrous, pink and red or usually

* This group and the Rhedophyceae were revised by Professor Ivy Lewis of the Marine Biological Laboratory, Woods Hole, Mass., and the University of Virginia. The thanks of the writer are due Dr. Lewis for valuable comments in connection.

bright red; calyx lobes short and obtuse; fruit black, shining, 6–8 mm. thick, ripening early in June. This form differs from the type essentially in its uniformly small and bright colored corolla.—Mountain slopes at head of Polk Creek, Montgomery County, Arkansas, where quite common in mixed oak and pine wood. W. W. A. May 2, 1924.

Vaccinium viride, sp. nov.—A shrub 2–3 dm. high, with green or reddish-tinged ascending branches and slender green pubescent twigs, or often merely pubescent on lines. Leaves thin but firm, bright yellowish green on both sides, glabrous above except for the puberulent midrib; glabrous below except for the pubescent midrib and sometimes scattered spreading hairs near the base, ovate, oblong, or oblong-ovate, 2.5 to 5.2 cm. long, 1.1–2.6 cm. wide, taper-pointed and mucronate, narrowed at the often broad base, finely ciliate-serrulate; petiole about 1 mm. long, pubescent. Flowers, appearing about the middle of April when the leaves are about half grown in clusters of 4 to 8, are urceolate or short cylindrical, 5 to 7 mm. long, cream colored, striped with red or reddish. Fruit, 7–9 mm. thick, glossy black, ripens the middle of June.

Prevailingly on dry sites in sunny oak wood, Montgomery County, Ark. Type from mountains near head of Polk Creek. W. W. A. May 2, 1924. It is possible that this is the plant which has been referred to *V. simulatum* Small. But V. *simulatum* differs in having much larger leaves which are pale and glaucescent below, in its larger flowers, glaucous fruit and different habit, being a tree-like shrub 2 to 4 m. high.

WASHINGTON, D. C.

A NEW WHITLOW-WORT FROM FLORIDA

JOHN K. SMALL

The two plant regions in Florida superficially most unpromising-looking are the Everglade Keys, composed of solid oölitic limestone, and the ancient dunes of the lake-region, composed of seemingly barren loose white siliceous sand. Yet, the floristics of these wholly unrelated areas are extremely interesting, and endemic genera and species are included in the plant-associations. The following is an additional herb to the flora of the lake-region.

NYACHIA Small, gen. nov. Annual wirey-branched herb. Leaves opposite, chartaceous: blades broad but revolute, entire. Stipules minute, fimbriate. Flowers very small, poly-

gamous or dioecious, borne in cluster-like cymules all along the branches, or solitary in the axils, the bracts resembling the leaves but smaller. Calyx campanulate or urcolate, nearly sessile in the bractlets: sepals 5, with very broad wing-margins and a thick mucro, hooded. Stamens 5, included: filaments short-filiform: anthers didymous. Ovary 1-celled, by abortion: styles 2, short, distinct: stigmas minute. Utricle lenticular, included. (Generic name an anagram of *Anychia*, a related genus.)

1. *N. pulvinata* Small. Stem branched at the base, the branches radially spreading and repeatedly dichotomous, 5–20 cm. long, wiry, minutely puberulent or pubescent: leaf-blades ovate to triangular-ovate, 1–5.3 mm. long, strongly revolute, obtuse, rounded or truncate at the base, sessile: stipules torn into capillary segments: bracts and bractlets in pairs: calyx 0.5 mm. long and slightly elongating in anthesis or in fruit, the sepal-hoods blunt-tipped, the winged margins broad, often suborbicular: anthers about 0.3 mm. long or less: utricle oval or ellipsoid, about 0.4 mm. long.—Ancient dunes, southern end of the lake region, Florida.

The southern part of the Florida lake-region is rich in endemic plants. The present genus is one of the less conspicuous plants, except as it forms in green spots on the snow-white sand. It is related to *Anychia*, but differs from it in the distinct styles and included fruits, the fleshy bractlets, and in the habit of growth. It is one of the smaller plants forming the association of the "scrub," but it is conspicuous by its bright green color and cushion-like growth, the plants appearing as mere tufts which often develop into cushions one to two feet in diameter. The type specimens, collected by the writer, in the "scrub" between Avon Park and Sebring, Florida, December 13, 1920, number 9782, are in the herbarium of The New York Botanical Garden.

The New York Botanical Garden.

THE ENGLISH SPARROW

I live in a large brick house, one wall of which is covered with Boston ivy and in the shelter of this handsome vine the English sparrows roost by the hundreds, old and young together. Nearby there is a very old English walnut tree in the corner of the vegetable garden, with a rose garden adjoining and a few peach trees scattered about. The sparrows are very tame,

drinking at the bird fountain and helping themselves to anything they wish in the garden or chicken coop. But with all this, I have been much interested in watching them catch insects like good, honest, hard-working native birds. They chase moths, work over a rosebush until every saw-fly is found, and assume the attitude and industry of warblers in their patience and thoroughness.

Black-locust trees shade the front porch of the house and these are badly infested with leaf-miners. I can not be positive, but what are the sparrows hunting when they go quietly from twig to twig through these trees unless it is the miners? And do they break through the epidermis of the leaf to get at them?

The only insects the sparrows seem to avoid are the hard, green "June-bugs" with very scratchy legs, which are so abundant just now that when I approach a peach tree on the fruit of which the beetles are feeding, it seems that I have disturbed a nest of big bumblebees. Robins and redbirds live in the back of the garden, but they also seem to avoid the "June-bugs."

It is only fair that I make this somewhat tardy and forced admission regarding the value of English sparrows in the great battle between insects and man.

I watched a most interesting contest between a female English sparrow and a bird-wing grasshopper,—the one with the pretty yellow and black wings that "dances" in the summer sunshine. For fully five minutes the sparrow chased the insect up and down the street, being foiled at every turn by the quickness of the grasshopper, which rose higher in the air or dropped to a lower level as an aeroplane would do to escape a Zeppelin. I never saw a bird seem so heavy and so helpless as this one in its continued vain efforts to make a captive, and it finally abandoned the chase, allowing the insect to fly away on triumphant wing.

W. A. MURRILL.

LYNCHBURG, VA., Aug. 11, 1924.

BOOK REVIEWS

HOUSE'S LIST OF NEW YORK STATE PLANTS*

No recent systematic paper better illustrates the intolerable conditions existing in nomenclature than this list of New York

* House, H. D. Annotated list of the ferns and flowering plants of New York State. Bull. N. Y. State Mus. 254: 1–757. September, 1924.

plants by the State botanist. As this review is being written (December 11) there are already ominous rumblings in that periodic, but almost continuous, warfare between the rival nomenclatorial camps,—a warfare as fratricidal and silly as any ever known in botany.

The reviewer once wrote in another connection "species and varieties are concepts of convenience, nay, of absolute necessity, in talking or writing about plants, but hardly expressions of exact truth." But are species and varieties even concepts of convenience when their names may be changed over night? The ecologist, or physiologist, or cytologist, or what not, cares not a straw whether systematic botanists bow down to the Gods of Priority in New York or of Precedence in Boston, but they are fast reaching the conclusion that unless systematic botanists agree to bow down to the God of Convenience, and make that adulation abject, they will pray for a quick finish fight,—and dance rather indecently upon the grave of the loser.

What all non-systematists pray for is that the gentlemen in whose hands rest the destiny of plant names substitute for their darling codes that kind of morality which understands that nomenclature is first and last an absolutely necessary *convenience*. What caters to that end is good,—all else is outside the pale.

Dr. House appears to suffer, like so many of his colleagues, from the uncertainty which this intolerable situation necessarily entails. On one page we read of the common sense retention of certain species names, hallowed by ages of use, while on another, and there are a distressing number of these, he is abject in his worship of priority, with disastrous consequences to equally well-known names. Scores could be mentioned, let one suffice. In 1923 the author felt moved to describe the white-flowered form of the common marshmallow as *Hibiscus Moscheutos* forma *Peckii*. That was unimpeachable, if one cares to designate mere color forms by names. In the present volume he abandons that recently christened infant because he takes up the Linnaean name *H. palustris*, and is, of course, forced to coin the new combination *Hibiscus palustris* forma *Peckii*. There are also many new names due to questions of interpretation of specific limits. With such honest differences of opinion all botanists will agree. Progress can only come from those able and willing

to study these propositions and report upon them. Such interpretations of fact whether they lead to new names or not are in a very different category from mere name changing. Upon this score Dr. House's new book will receive the respectful attention which its evident care and scholarship entitle it.

There can, of course, be nothing but praise for the undertaking—which has lain dormant since the flora of John Torrey in 1843. It is a tremendous piece of work to even list all the plants found in such a large and ecologically diversified state as New York. The author has, in addition to the State Herbarium, relied on printed lists or local floras, among them the reviewer's "Flora of the Vicinity of New York." In such a large book it would be incredible if some errors had not crept in. Of *Teucrium canadense* he says: "Recorded by Taylor as occasional on Long Island." I recorded it from Staten Island. And there are others. But to cite such here would be both useless and tend to create the impression that I am harping upon very thin strings. Actually the new work inspires admiration for its scope and intent, if a considerable amount of misgiving over some of its details. Its defects are mostly attributable to the causes outlined above, and from these Dr. House is no more immune than any of us.

NORMAN TAYLOR.

BROOKLYN, N. Y.

SHRUBS OF INDIANA

CHARLES C. DEAN*

This book is a sequel to the author's Trees of Indiana, which it resembles in size and binding as well as in plan and arrangement. It is well bound in cloth, printed on good paper and the typography is excellent. In these respects it is superior to the majority of state reports. 143 species are described as native to the state and two others,—*Rosa Eglanteria* and *Lonicera japonica*,—as naturalized. Some fifty other species are mentioned as having been reported from the state but are excluded because the author has been unable to verify their occurrence or because

* Publication No. 44 of the Department of Conservation of the State of Indiana, Dec. 1924; 351 pages, 148 plates.

they are regarded as escapes that have not become naturalized. One of these, *Berberis vulgaris*, is referred to as having frequently escaped, but due to the effort being made to exterminate it "this shrub will not become a member of our state."

The treatment of species is conservative, forms that intergrade are considered as one, the many opportunities to subdivide species being ignored. For example a special study was made of the poison ivy,—"the study suggests that the low erect forms are branches of underground stems; that the thick-leaved forms are always found in places exposed to heavy winds and direct sunlight; and the hairy-fruited forms are rare and are distributed throughout our area, and have no other character to distinguish them." The sand cherry, *Prunus pumila*, referred to as not well understood, is taken to include *Prunus cuneata P. susquehanae*, which have been described from the state.

The nomenclature followed is that of the International or Vienna Code. Where the name used differs from that in either the 7th edition of Gray's Manual or the 2nd edition of Britton and Brown's Illustrated Flora, the other names are given, otherwise synonyms are omitted. In most cases the only common name used is that found in Standardized Plant Names, where plants are not listed in this, the name that seems most commonly used is given, with the idea that each plant should be known by but one common name. The descriptions are clear and complete for each species, the distribution throughout the state is given in detail, while under the head of remarks are such items as the uses of the shrub in ornamental planting, its real or reputed medicinal value, questions of variation or habitat and the need of conservation.

There is a key to all the genera, under each of these is a key to the species. The keys are based chiefly on the leaf and twig characters. The book is illustrated with full page plates of each species made from photographs of herbarium specimens. The specimens have been so carefully prepared that in most cases the use of fresh material would have added nothing in value. Plant lovers and users of Indiana are to be congratulated on having a book of this nature so well done in every respect.

G. T. Hastings.

New York.

TREE HABITS

How to Know the Hardwoods*

The purpose of this interesting and inspiring book is, as the author states in his foreword, "to open the gateway to the delightful study of trees." Mr. Illick not only opens the gateway but he leads the reader through to the most interesting accounts of the habits, peculiarities, behaviors and traits of our tree friends.

The book contains seventeen chapters. Chapter 1, entitled "Trees" discusses trees in their relation to human beings and shows how they are in many ways like human beings, doing many things that man does, and in the same way that he does them.

Each of the next fifteen chapters deals with a certain family of trees. For example, Chapter 2 is entitled "The Willow Family"; Chapter 3, "The Walnut Family"; Chapter 4, "The Birch Family."

Each chapter is written in a very popular, though scientific, style so that the reader need not be a trained botanist or forester to understand and appreciate it. Simplified keys and tables, in which marked characteristics are used, make the separation of groups and the identification of species very easy. For instance in Chapter 3, "The Walnut Family," the six chief characteristics of walnuts and the six chief characteristics of hickories are given in two parallel columns. In like manner, the black walnut and the butternut are differentiated by enumerating in parallel columns seven contrasting characteristics of each. This visualized method of identification is used wherever possible throughout the entire book. In addition to these keys and tables, much interesting, useful, and in many cases, historical infomation about each of the important species is given.

The illustrations, consisting of numerous plates and text figures, are chosen with great care. These are very clear and inspiring and will be very useful in becoming acquainted with our North American tree friends.

* Tree Habits. Joseph S. Illick of the Pennsylvania Dept. of Forestry and Waters. Published by American Nature Association, Washington, D.C., 1924, 337 pages, illustrated.

Chapter 17, entitled "Guide to American Hardwood Trees" is original and unique and will be of great assistance in identification. In this chapter the trees are grouped under such headings as "Trees That Bear Pods," "Trees That Bear Spines or Thorns," "Trees Whose Leaves Turn Yellow in Autumn," "Trees That Bear Berries," and many other similar headings.

Mr. Illick, the author of "Pennsylvania Trees," "Trees Every Boy Should Know," "Fifty Common American Trees," "The Scout's First Book of Forestry," "Guide to Forestry," and many other articles on forestry, has made a life-long study of trees and has spent fifteen years in teaching boys and girls and grown-up folks how to know our trees, and how to understand their habits and to interpret their peculiar behaviors. This long study and experience in writing and teaching has fittingly prepared him to present to humanity "Tree Habits" in the popular humanizing, though scientific, style in which no other book on trees and forestry has before been written.

The book will be read and enjoyed not only by botanists and foresters but also by the layman and the student. It will prove very useful as a supplementary book in High School, College and University courses in Botany and, without doubt, will be adopted as a textbook by many Schools of Forestry.

E. M. Gress, State Botanist.

Harrisburg, Pa.

PROCEEDINGS OF THE CLUB

Meeting of October 29, 1924

The meeting of this date was held at the New York Botanical Garden. Three new candidates were elected to membership as follows:

Dr. Charles McCoy, Presbyterian Hospital, 41 E. 70th St., New York, N. Y.

Dr. Arthur P. Kelley, Rutgers University, New Brunswick, N. J.

Mr. Otto Degener, N. Y. Botanical Garden, Bronx Park, New York.

The first part of the scientific program was by Mr. Otto Degener on "Plant Collecting in Hawaii." Basing his computa-

tions upon Hillebrand's flora, the only comprehensive book in existence on Hawaiian plants, he stated that of the 850 species of vascular plants in Hawaii, 75% are endemic. And of this number 250 belong to about 40 endemic genera. This high percentage of endemism is due partly to the isolation of the entire group of islands, and partly to the isolation of each island from the other by stretches of ocean 10 to 75 miles in extent. Another factor is the range in temperature from that of the tropics at sea level to that of regions of everlasting snow on the mountain peaks. A third is the range in rainfall from almost nothing in the desert to over 400 inches on the highlands of Kauai. The floral affinity curiously enough is not with America, the nearest continent, but rather with Indo-Malaysia.

The variable Mesquite, early introduced by a priest and now spread throughout the arid lowlands, has become of great value. Endemic species of *Lobeliaceae* are numerous, *Rollandia* and *Clermontia* being two of the endemic genera. In areas where the mountains are deeply eroded, the Candlenut tree, *Aleurites moluccana*, is conspicuous by its glaucous foliage, while near the rain-forest grow different *Eugenias* and *Metrosideros*. In the rain-forest itself the tree trunks are plastered over with filmy ferns, *Ophioderma pendulum*, and the epiphytic *Lycopodium phyllanthum*. In such places also grow remarkable tree violets. Treeferns, such as *Cibotium Menziesii*, are plentiful. Their soft, downy ramentum or *pulu* was formerly used for stuffing mattresses.

Near Kilauea Volcano a different type of vegetation occurs. Both Psilotums are found here as well as two of the three endemic orchids. Very few *Rosaceae* appear, the commonest being *Fragaria chiloensis* and *Rubus rosaefolius*. Other common plants in the ashfields are *Lycopodium cernuum* and *L. venustulum*, *Gleichenia*, *Cyathodes Tameiameiae*, and *Vaccinium reticulatum* or Ohelo berry, which is eaten by the Hawaiian goose. A typical composite of this region is *Raillardia scabra*, noteworthy for its relationship to a Californian genus. Strange areas in the vicinity are the kipukas or "oases," i. e., regions that have escaped the numerous lava flows. Here many of the rarest plants may be found.

In the discussion which followed, Mrs. Britton remarked that it was most interesting to find plants here identical with those in the West Indies, e. g., *Psilotum nudum*.

Dr. Michael Levine next gave a short talk entitled "Studies in Plant Cancers."

Crown gall was produced in Bryophyllum leaves by inoculations of the buds in the notches of the leaves with *Bacterium tumefaciens.* On 48 leaves thus inoculated, 199 globular crown galls were formed and only 31 crown galls showed leafy shoots; that is, one crown gall with leafy shoots developed to every eight crown galls of the globular type. Twelve uninoculated leaves growing under conditions which favored the development of the marginal buds, produced 106 shoots on these leaves. A short report on this subject appears in the November number of the Bulletin of the Torrey Botanical Club.

A report on the development of secondary tumors was also given. So-called secondary tumors have been found at points distant from the original place of inoculation. This is due to the fact that the original inoculation is made in the region of a growing zone. The growth of the infected tissue keeps pace with the growth of the organ. Unlike animal cancer, crown gall tissues do not produce infiltrating strands or secondary tumors. Efforts to produce secondary tumors by means of such devices as water soaking, slitting the growing points, and making long perforations in the growing zone, yield no secondary tumors or strands.

Arthur H. Graves,
Secretary.

Meeting of November 11, 1924

The meeting of this date was held at the American Museum of Natural History.

The resignation of Mr. Claude E. O'Neal was accepted.

The following candidates were elected to membership:

Mr. Edwin E. Matzke, 3075 Hull Avenue, New York, N. Y.

Mrs. Paula Milton, Wildwood, Katonah, New York.

Miss Helen E. Saunders, 454 Seventh Street, Brooklyn, N. Y.

Dr. M. A. Chrysler, Professor of Botany at Rutgers University, gave an illustrated lecture on "Collecting Cycads In Cuba," a trip which was made possible by assistance kindly furnished by the New York Academy of Sciences. The speaker stated that the trip occupied part of August and September of the

present year, and was restricted to the cycad fields of western Cuba, the Isle of Pines, and Florida. The chief object was the collection of material of *Microcycas*, the range of which is a very restricted one, although on the present occasion the plant was located at a much lower altitude than had been previously reported. A short description was furnished of the vegetation of a "mogote" or limestone butte, illustrated by those which occur in the vicinity of Viñales. Among the distinctive plants of these cliffs is *Zamia latifoliata*, while the common *Zamia* of of the siliceous hills is *Z. Kicksii*. Lantern slides were used to illustrate the characteristic vegetation of the regions which were visited.

ARTHUR H. GRAVES,
Secretary.

NEWS NOTES

Dr. James A. Faris, a member of the Club and for the past three years Research Fellow at the Brooklyn Botanic Garden, has been chosen by the trustees of the new Tropical Plant Research to have general supervision of all field work on tropical plant diseases, with particular reference, at present, to root rots of the sugar cane. In his investigations at the Brooklyn Botanic Garden along the line of smut disease of cereals, Dr. Faris made some valuable contributions of scientific and practical significance—in particular his discovery of physiological specialization of cereal smuts. He was appointed last June a National Research Fellow by the National Research Council to continue these investigations at the Brooklyn Botanic Garden. This position he has now resigned to take up again the work of tropical diseases for which his former experience as plant pathologist at the Estacion Agronomica of the College of Agriculture, Santo Domingo, renders him peculiarly well fitted. He is temporarily located at the Harvard Laboratory, Central Soledad, Cienfuegos, Cuba. The permanent location for the new tropical field research laboratory has not yet been fixed upon.

The Tropical Plant Research Foundation was incorporated on June 6, 1924. As stated in a recent announcement, its particular objects and business are "to promote research for the

advancement of knowledge of the plants and crops of the tropics; to conduct investigations in plant pathology, entomology, plant breeding, botany and forestry, horticulture, and agronomy, and to publish the results thereof; and to establish and maintain such temporary or permanent stations and laboratories as may be necessary for the accomplishment of these objects, under the restrictions and regulations established in its by-laws."

The central office of the Foundation is in Washington. The laboratory headquarters in the United States will be at the Boyce Thompson Institute for Plant Research, Yonkers, New York, where the facilities for this type of work are unexcelled.

Ezra Brainerd, President Emeritus of Middlebury College, a recognized authority on the violets of North America, died at his home in Middlebury, Vt. on December 8th, at the age of eighty. President Brainerd was the author of the Flora of Vermont, of The Violets of North America and of many other botanical articles. His last publication, Violet Hybrids, appeared only a few months before his death. He contributed various papers to the Bulletin of the Torrey Botanical Club as well as to other botanical magazines.

At the Washington meeting of the American Association for the Advancement of Science, Dr. M. I. Pupin, Professor of Electro-mechanics at Columbia University, was elected president for the coming year. Professor R. B. Wylie of the State University of Iowa was elected vice-president to represent the Botanical Section, and S. F. Trelease, Professor of Plant Physiology at the University of Louisville, was elected secretary of the Botanical Section.

The Bennington National Forest, near Columbus, Ga. has been created by proclamation of the President. The area was turned over by the War Department, having been included in the military reservation there. The forest service expects to develop the excellent stand of Southern pine on the area and to derive an income from it at the same time. Other army reservations created during the war may also be turned over for national forests.

Dr. William A. Murrill, after twenty years on the staff of the New York Botanical Garden, has resigned and is now at Gainesville, Fla. At the time of his resignation Dr. Murrill was Supervisor of Public Instruction at the Garden.

Dr. Frederick S. Lee, Research Professor of Biology at Columbia University, has been reelected president of the Board of Managers of The New York Botanical Garden.

The Rockefeller Foundation has appropriated $350,000 to help finance the new abstract journal, International Biological Abstracts, which will begin publication the first of 1926. The journal will give monthly abstracts of all publications of botany, zoology, bacteriology and related sciences.

Dr. W. A. Orton has resigned as Pathologist in charge of the Office of Cotton, Truck and Forage Crop Diseases in the Bureau of Plant Industry, Washington to become Scientific Director and General Manager of the Tropical Plant Research Foundation.

The Torrey Botanical Club

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OF THE

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(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
Brooklyn, N. Y.

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BY

GEORGE T. HASTINGS

John Torrey, 1796-1873

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2567 Sedgwick Ave.
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TORREYA

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March-April, 1925

CLIMBING A MOGOTE.

M. A. Chrysler

Ever since reading Henderson's "Cruise of the Tomas Barrera" I had wished for an opportunity to visit those remarkable *mogotes*, or limestone buttes of western Cuba. Although Henderson's visit to Cuba was primarily for the purpose of collecting land mollusks, the vegetation of the mogotes near Viñales proved so interesting that some of the conspicuous plants are described in the book.

Through the much appreciated support of the New York Academy of Sciences I was able in August 1924 to undertake a trip to western Cuba for the purpose of collecting cycads especially the endemic *Microcycas calocoma* Miq., material of which was needed for morphological work. This trip afforded the desired opportunity of exploring a mogote, for Viñales is not far from the *Microcycas* country.

After making San Diego de los Baños my base for some days I had the good fortune to be joined by Dr. Juan T. Roig, botanist of the Cuba Experiment Station, and the success of the trip here described was largely due to Dr. Roig's efficient guidance. After settling in Pinar del Rio as our base we determined to make an early attempt to ascend one of the large mogotes, and so on the morning of the twenty-fourth of August we gathered our portfolios and trowels, hired a *fotingo*,* and rattled off toward Viñales. I got the impression on this and other occasions that whenever the driver of a *fotingo* realized that he had an American on board he considered it his duty to drive faster than any other auto on the road. At any rate we soon left Pinar far behind on the level country to the south, and began to cross the first of the irregular ridges, which in contrast to the mountains near Viñales are siliceous in composition and have an undulating contour—the so-called *lomas*. As the ascent became steeper and the road twisted right and left we gained fine views of the south side of the island. The vegetation of the rounded slopes of the *lomas* is rather monotonous, consisting chiefly of *Pinus caribaea* Morelet, with occasional patches of

* Cuban name for a Ford car.

Quercus virginiana Mill. The soil is poor and quite resembles that on which I had found specimens of *Zamia Kickxii* Miq. at San Diego de los Baños. After spending a half-hour in crossing the ridges one comes suddenly to the rim of an extensive flat valley, and a beautiful panorama lies spread out before him. In this valley lies the village of Viñales, and from the surrounding tobacco fields arise the mogotes, large and small, which are readily distinguished from the lomas by their steep sides, light color and irregular contours. Some of the mogotes such as the one pierced by the road at "Km 14" are not larger than a good-sized church, but these are mere outliers to the chain called Sierra de los Organos, or Organ Mountains, which form the remains of a limestone ridge extending for many miles at a short distance north of the last siliceous ridge. After descending into the village of Viñales we were courteously entertained at the home of Señor Francisco Azcuy, who had previously acted as guide for Dr. Roig, and who intimately knows the intricate trails up the mogotes, through long experience in climbing them in search of *Bombax emarginata*, a tree used as a source of fibre. After "breakfast" we secured the services of a second guide, and the four of us walked across about a mile of the plain country which is regarded as choice tobacco land and also produces a fine quality of *taro*. Unexpected and interesting plants were met at every turn, including the big *Euphorbia lactea* used for hedges, the showy orange *Crotalaria retusa* L., and a clump of *Opuntia stricta* Haw. A nearly ripe fruit of this plant was cut open by one of the guides, displaying the magenta flesh in which the seeds are imbedded. Presently we came to the foot of Mogote de la Bandera ("flag-hill"), so called because in the great national days there was a man who used to post a flag on top of it.

As soon as one glances across the face of a mogote ne realizes that here is represented a flora of great richness and variety. With our expectations at high pitch and with our fingers itching to get hold of one of the big *Pitcairnias* which we saw reposing in a crevice safely out of ıeach, we began to examine an accessible part of the cliff base. Dr. Roig was soon rewarded by locating a flowering specimen of the *Peperomia* which had been named after him when only the leaves were known—a peculiar little trailing plant with leaves a centimeter wide and shaped like those chocolate covered tablets which I took along for sea-

sickness. More striking objects attracted the attention of the visitor, and he began to fill up the canvas sack with specimens of *Agave spicata* and *Anthurium venosum* Griseb., hoping to grow them in Rutgers' greenhouse. Both of these species are said by Dr. Roig to be peculiar to these mogotes. Conspicuous among the plants hanging from the cliff was the lovely *Siemensia pendula* (C. Wr.) Urb. with its trumpet-shaped white flowers in large clusters, while several kinds of palms found lodgment in crevices, such as the feather-leaved *Gaussia princeps* and the fan-leaved *Thrinax microcarpa*, both of these being species restricted to the limestone rocks. Among the ferns growing as crevice plants near the base were *Adiantum fragile* Sw., *A. tenerum* Sw., *A. trapeziforme* L., *A. villosum* L., a dwarf form of *Aneimia* (*Ormithcpteris*) *adiantifolia* and *Asplenium dentatum* L., here reaching a size not observed in other stations.

So far we were collecting in a sort of bay between two parts of the ridge, and the flora was so rich that Roig had to remind the visitor that time was passing, and there was stiff climbing ahead. So we asked the guides to lead on and show us the way to ascend what looked as impregnable as Gibraltar. We soon found that although roots were treacherous and loose rocks worse than useless, the projections left during erosion of the rock often made excellent footholds. Dr. Roig had warned me not to attempt to carry a camera, for I would need to have both hands free; I presently came to places where it seemed necessary to hang on with both hands and also with one's teeth.

After climbing for half an hour, with such collecting as we could do during the scramble, we came to what might be described as a steep gorge, and here we paused to put into our portfolios the specimens we had snatched on the way, while the guides succeeded in locating for me several specimens of *Zamia latifoliata* Frenelaus, found growing in humus contained in pockets of the limestone. This species well merits its name, and shows a remarkable venation, with its nearly parrallel veins ending at the irregularly jagged apex of each leaflet. A small terrestrial orchid, *Physurus sagraeanus* Rich. was collected here, also fine specimens of *Selaginella stolonifera* (Sw.) Spring.,* a species

* This identification is in doubt. Dr. W. R. Maxon, who has been kind enough to look over my Cuban Pteridophytes, is of the opinion that the collections include two species of *Selaginella*, and has promised to furnish names at a later date.

growing flat upon the surface of the rock. At one side of what I have called a gorge appeared a sort of shady grotto, into which I went, and where I received one of the surprises of my life. Clambering down into the grotto I had collected several strange ferns, one of them being *Asplenium myriophyllum* Pr., and had turned preparatory to climbing out, when there yawned before me a great black shaft stretching downward to an unknown depth. Fortunately my nerves were steady, and I managed to emerge from the uncanny spot carrying my precious specimens to a place of safety. There I found Dr. Roig industriously sorting his specimens, and he informed me that the sierra is full of caves and chasms.

Although we seemed to be near the top of the mountain, Dr. Roig assured me that we were not more than half way up, and had come only 100–150 metres. Lest we should be caught by darkness we reluctantly prepared to descend, and were succesful in reaching level ground without mishap.

A canvass of our collections showed the following species in addition to those already mentioned: *Asplenium abscissum* Willd., *Cheilanthes microphylla* Sw., *Polypodium eqiguum* Hew. (growing on a tree-trunk), *Peperomia commulata* Trelease, *Pilea microphylla* Liebm., *Rajania Wrightii* Olive, *Samyda grandiflora* Griseb., *Chiococca racemosa* L. and an unnamed species of *Clusia*.

A few days later I was able to visit the Puerta del Ancon, a pass in the sierra on the road from Viñales to Esperanza. This gave an opportunity to observe the vegetation on the north face of a ridge, and resulted in the collection of a great clump of a fern with grass-like leaves (*Campyloneuron angustifolium* Sw. Fee), a *Rhipsalis* with white berries (*R. cassytha* L.) while on small mogotes it was easy to collect *Pitcairnia penduliflora* Mez., *Polypodium aureum* L. and several epiphytic orchids. A threatening thunder cloud cut short this trip, much to my regret.

The most impressive feature of the flora of the mogotes is its individuality. Concerning one after another of the plants Dr. Roig informed me that the species occurs nowhere except on the mogotes—the *Thrinax*, *Anthurium*, *Agave*, etc., found here are different species from those found in other parts of western Cuba. To ascribe these differences to the lime found in the pockets of soil on the mogotes would be to open up an ancient controversy, but it is difficult to persuade oneself that the chemical peculiar-

ities of the soil do not have something to do with the individuality of the flora. As I told my conductor, I was already familiar with a peat bog, a sand dune, a salt marsh; I have now added to the list another ecological community—the mogote. So let us prepare to jump into our fotingo and be rushed back to the *Poincianas* and *Crotons* of Pinar del Rio.

RUTGERS UNIVERSITY,
NEW BRUNSWICK, N. J.

UNREPORTED PLANTS FROM LONG ISLAND, N. Y.

II CRYPTOGAMS—PART 2.*

N. M. GRIER

EUMYCETES†

PHYCOMYCETES

ALBUGINACEAE

Albugo portulacae (DC) O. Kuntze. On *Brassica oleracea* in gardens. C. S. H. A. F. B.

ANCYSTILACEAE

Ancylistes closterii Pfitzer. Parasitic on *Closterium.* sp. C. S. H. N. M. G.

MUCORACEAE

Phycomyces nitens (Agard.) Kunze. Growing on dung in woods. C. S. H. A. F. B.

Thamnidium elegans. Link. On rat dung culture. C. S. H. M. A. B.

PERONOSPORORACEAE

Peronospora parasitica (Pers.) Fr. On *Lepidium virginicum.* C. S. H. A. F. B.

SYNCHITRIDACEAE

Synchytrium decipiens Farlow. Common or *Amphicarpa monoica.* C. S. H. A. F. B.

ASCOMYCETES

ASCOBOLACEAE

Ascophanus carneus (Pers.) Boud. On dung. Lloyds Neck. N. M. G.

Ascobolus stercorarius (Bull.) Schr. On cow dung at first lake. A. F. B

* Part 1 appeared in the January–February number of Torreya.

†Revised by Dr. A. H. Graves, Brooklyn Botanic Garden with regard to most convenient usage, following Saccardo's "Sylloge Fungorum" and Oudemann's "Enumeratio Systematica Fungorum," and Engler and Prantl.

GEOGLOSSACEAE

Geoglossum americanum (Cooke) Sacc. On moss. C. S. H. D. S. J.
Geoglossum glutinosum Pers. On moss near 3d lake. C. S. H. M. A. B.
Geoglossum ophioglossoides (L.) Sacc. Mossy banks. C. S. H. D. S. J.
Leotia viscosa (Fr.) Schr. Occasional in woods. C. S. H. D. S. J.

HELOTIACEAE

Monilia cinerea Bon. On plum trees. C. S. H. A. F. B.

HELVELLACEAE

Helvella crispa (Scop) Fries. Marsh near 2nd lake. C. S. H. A. F. B.
Helvella lacunosa Fr. On ground in woods. C. S. H. D. S. J.

HYPOCREACEAE

Chromochrea gelatinosa (Tode) Seaver. On rotten logs near 1st lake. C. S. H. A. F. B.
Hypomyces hyalinus (Schw.) Tul. Common in woods. C. S. H. A. F. B.
Hypomyces chrysospermus (Bull.) Tul. Common in woods. C. S. H. A. F.B.
Nectria peziza (Tode.) Fr. West of lakes on dead limbs. C. S. H. A. F. B.

PYRONEMATACEAE

Pyronema confluens Tul. 1st lake. C. S. H. A. F. B.

RHIZINIACEAE

Psilopeziza Babingtonii Berk. Rotten logs near 1st lake. C. S. H. D. S. J.

XYLARIACEAE

Daldinia concentrica De Not. On birch log in lake region. C. S. H. M. A. B.

BASIDIOMYCETES

AGARICACEAE

Agaricus diminutivus PN. In woods near De Forest Estate. C. S. H. M. A. B.
Amanita phalloides var. *viridis* Pers. Huntington Road. C. S. H. M. A. B.
Amanita strobiliformis Fr. C. S. H. M. A. B.
The three varieties sometimes listed as *alba, fulva, and livida* are also reported.
Amanitopsis volvata PK. On ground between 1st and 2nd lakes. C. S. H. G. C. F.
Boletinus cavipes. (Opat.) Kalckb. On ground near 2nd lake. C. S. H. D. S. J.
Boletinus porosus (Berk.) PK. On moss, on ground old railway survey west side 2nd lake. C. S. H. D. S. J.
Boletinus porosus var. *opacus* PK. On ground west of lower lake. C. S. H. D. S. J.
Clitocybe candida Bres. On ground. C. S. H. M. A. B.
Clitocybe gigantea (Quél.) Cham. Sandy soil. C. S. H. M. A. B.

Clitocybe infundibuliformis Bull. Ground in woods C. S. H. M. A. B.
Clitocybe media PK. Vicinity of lakes. C. S. H. M. A. B.
Collybia butyracea (Bull.) Quél. On decayed leaves, lake region. C. S. H. G. C. F.
Cortinarius sp. On dead and decaying leaves west of 1st and 2nd lakes. C. S. H. G. C. F.
Hygrophorus cantharellus. Schw. Fresh water marsh near fish hatchery. C. S. H. M. A. B.
Hygrophorus conicus (Scop) Fr. On ground, woods. C. S. H. M. A. B.
Hygrophorus fuligineus Frost. C. S. H. M. A. B.
Inocybe cincinnata (Fr.) Gillet. On ground beneath pine trees. C. S. H. M. A. B.
Lactaria lignyotus. Fr. Near research laboratory in sandy soil. C. S. H. M. A. B.
Lepiota naucina. Fr. Sandy soil. C. S. H. G. C. F.
Marasmius nigripes Schw. On oak leaves at De Forest Estate. C. S. H. M. A. B.
Marasmius sarmentosus Berk. On fallen oak leaves and twigs. Huntington Road. C. S. H. M. A. B.
Omphalia caespitosa Bot. Old tree stumps near DeForest Estate. C. S. H. M. A. B.
Panaeolus campanulatus L. On horse dung west of 2nd lake. C. S. H. G. C. F.
Panus albido-tomentosus. Cke. On moss twigs. C. S. H. M. A. B.
Panus torulosus var. *conchatus* Fr. DeForest Estate. C. S. H. M. A. B.
Russula crustosa. PK. Roadsides, DeForest Estate. C. S. H. M. A. B.
Russula cyanoxantha. Schaeff. Ground, woods near lakes. C. S. H. M. A. B.
Russula roseipes (Secr.) Bres. Back of DeForest Estate. C. S. H. M. A. B.
Hyponeuris alneus (L.) Earle. On black cherry bark. C. S. H. M. A. B.

AURICULARIACEAE

Calocera cornea (Batsch) Fries. C. S. H. A. F. B.
Dacromyces chrysocemus (Bull.) Tul. Rotten branches on ground near school house. G. C. F.

CALOSTOMATACEAE

Calostoma cinnabarinum Corda. Woods, west of lakes. C. S. H. A. F. B.

CLAVARIACEAE

Clavaria circinans. PK. Woods near lakes. C. S. H. M. A. B.
Clavaria coronata. Schw. On birch woods near lakes. C. S. H. M. A. B.
Clavaria fusiformis Sow. Between 2nd and 3rd lakes C. S. H. G. C. F.
Clavaria pistillaris L. Ground between 1st and 2nd lakes . C. S. H. G. C. F.
Clavaria stricta, var *fumida* Pers. On ground. C. S. H. M. A. B.
Lachnocladium Michineri B. and C. On wet ground, Center Island. M. A. B.
Sparassis tremelloides Berk. Oak stump on hill near laboratory. C. S. H. G. C F.

CORTICIACEAE

Corticium comedens (Nees) Fr. On cherry birch. C. S. H. M. A. B.
Stereum compactum Pers. Road to Huntington. C. S. H. M. A. B.
Sterigmatocystis sp. On horse chestnut bur. C. S. H. M. A. B.

EXOBASIDIACEAE

Hirneola auricola-Judae (L.) Berk. C. S. H. M. A. B.

HYDNACEAE

Hydnum repandum L. C. S. H. A. F. B.
Irpex deformis. Fr. Woods near lakes. C. S. H. M. A. B.
Irpex fusco-violaceus (Schr.) Fr. Near lakes, on birch bark. C. S. H. M. A. B.

LYCOPERDACEAE

Bovistella chiensis E. and M. Goat pasture. C. S. H. G. C. F.

PHALLACEAE

Mutinus caninus (Huds.) Fr. Frequent on soil near laboratory, and in woods. C. S. H. D. S. J.
Mutinus elegans. Mont. Under old leaves in chestnut woods, Huntington Road. C. S. H. M. A. B.

POLYPORACEAE

Boletus auripes PN. Huntington Road. C. S. H. M. A. B.
Boletus bicolor PK. Ground. C. S. H. M. A. B.
Boletus griseus Frost. Ground, west of 2nd lake. C. S. H. M. A. B.
Boletus indecisus PK. Woods, west of 2nd lake. C. S. H. N. M. G.
Boletus ornatipes PK. Open woods, Huntington Road. C. S. H. D. S. J.
Boletus Russelli Frost. Open woods, Huntington Road. C. S. H. D. S. J.
Daedalea confragosa (Bolt.) Pers. Old stump. Sagamore Hill. Oyster Bay. M. A. B.
Fistulina pallida B. and R. Frequent on chestnut. C. S. H. M. A. B.
Polyporus lucidus Fr. On stumps, Hempstead Plain, Hicksville. M. A. B.
Polyporus obliquus Pers. Old log to left of Sandpit. C. S. H. M. A. B.
Polyporus robiniophilus Fr. Old locust trees near village. C. S. H. M. A. B.
Polystictus abietinus (Dick.) Fr. Old limb. C. S. H. M. A. B.
Polystictus cinnabarinus Klotz. On chestnut posts near rectory. C. S. H. D. S. J.
Polystictus connatus Schw. Woods, west of lakes. C. S. H. A. F. B.
Simblum sphaerocephalum Schlacht. Near Jones residence. C. S. H. N. M. G.

PUCCINIACEAE

Uromyces fragarioides. On *Duchesnea indica* near laboratory. C. S. H. M. A. B.
Uromyces statices B. and C. On *Statice limonium* at Lloyd's Neck, L. I. A. F. B.

SPHAEROBOLACEAE

Sphaerobolus carpobolus. L. Rotten logs near 1st lake. C. S. H. D. S. J.

THELOPHORACEAE

Craterellus sinuosus var. *crispus* Fr. On ground in woods at Tiffanys. M. A. B.

Michinera Artocreas B. and C. C. S. H. N. M. G.

Solenia villosa Hoffm. On decaying branches of *Rubus* near schoolhouse. C. S. H. M. A. B.

TILLETIACEAE

Entyloma rhodopalium (Fr.) Quél. DeForest Estate. C. S. H. M. A. B.

TREMELLACEAE

Tremella vesicaria Eng. Bot. On rotten branches and ground near schoolhouse. C. S. H. G. C. F.

FUNGI IMPERFECTI

MUCEDINACEAE

Botrytis cinerea Pers. On leaves of *Symplocarpus foetidus.* C. S. H. A. F. B.

Mycogone incarnata Pers. On decaying *Agaricus.* C. S. H. A. F. B.

Sepedonium chrysospermum (Bull.) Fr. Parasitic on *Boletus* near fish hatchery. C. S. H. A. F. B.

Conidial stage of *Hypomyces chrysospermus.*

Stachybotrys lobulatā Cords. On goat dung. Lloyd's Neck. C. S. H. A. F. B.

SPHAERIOIDACEAE

Phyllosticta minima (B. and C.) E. and E. On *Acer rubrum.* DeForest Estate. C. S. H. N. M. G.

Phyllosticta Catalpae E. and M. On *Catalpa* sp. Havemeyers Estate. C. S. H. M. A. B.

Phyllosticta terminalis E. and M. On *Leucanthöe* sp. C. S. H. M. A. B.

Phyllosticta smilacis E. and E. On *Smilax glauca.* C. S. H. M. A. B.

Phyllosticta Halstedii E. and E. On *Syringa vulgaris.* C. S. H. M. A. B.

Our records confirm the presence on Long Island of the following species of Fungi listed by Burnham and Latham (1914-23) *Cystopus candidus, Taphrin alnitorqua, Chlorosplenium æruginosum, Sclerotinia fructigena, Lachnea scutellata, Rosellinia subulata, Amanita Frostii, Amanitopsis vaginata, Paneolus retirugis, Pleurotos sapidus, Russula emetica, Hydnum zonatum, Phaeodon imbricatum, Lycoperdon Cyathiforme, Dictyophora duplicata. Fomes applanatus, Polystictus cinnamoneus, Uromyces polygoni, Ulocalla foliacea, Polystictus hirsutus, Boletus auriporus, Polystictus versicolor, Omphalis campanella.*

*LICHENES**

CLADONIACEAE

Cladonia fimbriata (L.) Fr. On ground. C. S. H. S. A. G.
Stereocaulon condensatum Hoffm. On ground. C. S. H. S. A. G.

HEPATICAE†

JUNGERMANNIACEAE

Bazzania trilobata (L.) S. F. Gray. At foot of tree, 2nd lake. C. S. H. D. S. J.

MUSCI‡

DICRANACEAE

Dicranum longifolium (Ehr.) Hedw. C. S. H. G. H H.

LESKEACEAE

Thelia asprella (Schimp.) Sull. On tree. C. S. H. D. S. J.
Ptilium Crista-castrensis (L.) De Notaris. N. M. G.

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†Revised following the nomenclature of "Second Revised List of New England Hepaticae." A. W. Evans. *Rhodora* 25.

‡Revised by O. E. Jennings following nomenclature given in "Mosses of W. Pennsylvania." O. E. Jennings Carnegie Museum, Pittsburgh, Pa. (1913).

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DARTMOUTH COLLEGE, HANOVER, N. H.

THE LILIES OF THE FIELD

(Extract from the lecture by Dr. Ephraim Ha Reubeni on "New Light on the Flora of the Old and New Testaments," given before the Club December 9, 1924. Translated from the Hebrew by David de Sola Pool.)

It may be interesting to turn our attention for a moment to the most famous of the plants of the New Testament, the lilies of the field, *Krinon Agrion*, mentioned in Matthew VI, 28, and Luke XII, 27. In the parable, Jesus says that "Even Solomon in all his glory was not arrayed like one of these. But if God doth so clothe the grass in the field, which today is, and tomorrow is cast into the oven . . . ."

What actually is the plant referred to?

Many varying answers have been given to this question. L. Fonck,* in his "Streifzüge durch die Biblische Flora" thinks that it is the *Lilium candidum*. But this is not found at all in Palestine and one would have to go to the Lebanon to find it. Furthermore, the *Lilium candidum* is not the Greek *krinon* but the *leuiron*. Tristram† in his "Natural History of the Bible" is of the opinion that it is the *Anemone coronaria*.

But this plant is not thrown into the oven.

Others think it to be *Ranunculus asiaticus*. Post‡ proposes the *Gladiolus*. Kitto§ suggests the *Lotus*, while others propose the *Crocus*, the *Colchicum*, the *Tulipa praecox*, the *Iris*, the *Lilium Martagon* and the *Lilium cephalodonium*. P. Souciet¶ in his "Recueil de dissertations critiques sur les endroits difficiles dans l'Ecriture sainte" is of opinion that it is the *Fritillaria imperialis*. But this also is not in keeping with the phrase "and tomorrow it is cast into the oven."

In view of all these doubts and uncertainties some, therefore, feel that in these words Jesus was not referring to any specific plant but to the plants of the field in general. But anyone reading this in its plain sense must realize that here the reference is to some specific plant which grows abundantly, to which Jesus could point and which his hearers would recognize for its outstanding beauty. In my opinion, scholars have strayed very far afield from a correct solution to this problem. They have not proceeded from a correct conception of the question involved. They have looked for a plant outstanding in size and color.|| Many of them have demanded that it be a plant with red or purple coloring, because, in their opinion, King Solomon was robed in regal purple.

But it seems to me that a more refined taste gets more aesthetic

*Fonck, Leopold. Streifzüge durch die Biblische Flora. Fribourg, 1900. pp. 53-77.

†Tristram, Henry B. The natural history of the Bible. London. 1889. p. 464.

‡Post, George, E. Flora of Syria, Palestine and Sinai. Beirut. p. 773.

§Kitto, J. A cyclopedia of biblical literature. 3rd Ed. London. 1886. Vol. 3. p. 845.

¶Souciet, P. Recueil de dissertations difficiles de l'Ecriture Sainte. Paris. 1715. pp. 158, 9.

||Levesque, E. Dictionnaire de la Bible de F. Vigourant. Vol. 55. p. 283.

satisfaction in the beauty of less violent colors, and in a plant which is not necessarily strongly assertive and springing to the eyes of every beholder. I am of opinion that this was the taste of the Jews of old and that this was the taste of Jesus. Jesus' own words "And I say unto you" which occur so frequently in Matthew and Luke, would seem to bear this out. These words "And I say unto you" spoken of the *Krinon Agrion* would indicate that this plant had a special beauty all its own which was not so readily obvious to the masses, and that Jesus was calling attention to it as would a poet revealing an unexpected beauty.

On the background of this conception of the verse I believe we can find the correct interpretation of the "Lilies of the Field." Let us remember the words of the following verse, "If God so clothe the *grass* in the field," to which insufficient attention has been paid. The *Krinon Agrion*, whatever it is, has to be of the general character of grass. We cannot assume that the phrase "grass in the field" is only a figurative expression, for this is not in keeping with Hebrew style.

What then is the solution of the problem? Among the most ancient translations of *Krinon Agrion* is that of Dioscorides who translates it ABIB-LABON. This is an ancient Hebrew name which has been forgotten for two thousand years. From the linguistic point of view on the one side as well as from the point of view of nature, from the aesthetic conception involved, from the term grass, the phrase about throwing into the oven—from all these considerations we suggest with considerable confidence that the "lily of the field" is the *Anthemis Palestina*.

In ancient Hebrew, Abib-Labon, which is Dioscorides' translation of *Krinon Agrion*, means white flower. I have learned from the mouth of the Bedouin in the district south of Gaza that they call the *Anthemis*, HANUN ABIAD, which is the Arabic for white flower. These Bedouin have lived far from foreign influences, and have preserved the ancient name of this plant.

The *Krinon Agrion* is therefore, for all these reasons, not the Lily of the Field nor any other of the flowers with which it has been indentified, but is the simple *Anthemis* or daisy. The daisy suits all the conditions demanded by the parable. It is neither red nor purple but is beautiful with a modest and delicate beauty of its own. It is beautiful at all hours of the day. It is beautiful

at every period of its growth, even when it is old and even when it is drying. When it has dried up it is gathered together with the dried grass and cast into the furnace.

Its delicate beauty, and this, its ultimate fate, suggested to Jesus the thought of his parable, and he points out as something which the ordinary observer would not readily see, "yet I say unto you that even Solomon in all his glory was not arrayed like one of these . . . . . . which today is, and tomorrow is cast into the oven . . . . . ."

Let us remember also that the daisy has a crown, which gives special aptitude to the comparison with Solomon, the crowned king. The words "the grass in the field" are surely and naturally applicable to the *Anthemis* which grows like grass in Palestine. The beauty of the *Anthemis* and its crown are particularly noticeable in the morning's early dawn.

Can we not imagine that the thoughts and emotions which surged in Jesus did not always allow him easy sleep, that they awakened him at the dawn, that he went out in the fields among the hills walking in the early morning light over these fields of the delicate *Anthemis* with its simple crowned beauty, and that on some such morning there was born in the heart of Jesus this beautiful parable?

A NEW VARNISH-LEAF TREE FROM THE FLORIDA KEYS

JOHN K. SMALL.

Two species of *Dodonaea* have heretofore been known to grow in Florida. However, these were generally misinterpreted until well within this century. A large-leaved kind—*Dodonaea viscosa*—is rather rare on the coasts of the peninsula, while a smaller-leaved shrub—*D. jamaicensis*—grows both in the coastal regions and in the interior. Several years ago a third species was discovered on Big Pine Key. It was provisionally referred to the West Indian *D. Ehrenbergii**. Recent studies show that it is not referrable to any tropical American species and indicate that the Florida Key plant has not yet been described. It may be named and described as:

*Journal of the New York Botanical Garden 22: 50. 1921.

Dodonaea microcarya Small, sp. nov. A shrub or a small tree 6 m. tall, with a trunk diameter up to 15 cm., the bark rough, the twigs reddish, glabrous: leaves numerous; blades cuneate to obovate-cuneate or broadly spatulate, 1-5 cm. long, usually less than 4 cm., thick, entire, rounded or emarginate at the apex, glabrous, short-petioled: flowers not seen; fruit suborbicular in outline, often somewhat depressed, less than 1 cm. wide, usually 5-7 mm. across the wings, emarginate at the apex and tipped with the blunt style base, short-stipitate, the pedicel as long as the fruit or shorter; seeds subglobose, nearly 2 mm. in diameter, smooth but scarcely shining.—Hammocks, Big Pine Key, Florida.

This plant has no close relative among the *Dodonaea* of the American tropics. Its foliage somewhat resembles that of the Hawaiian *Dodonaea spatulata*, but the leaf-blades are more decidedly cuneate and the fruits are much smaller. The type specimens collected on the northern part of Big Pine Key, Florida, May 8, 1919, by John K. Small, Alfred Cuthbert, and Paul Matthaus, number 9105, are in the herbarium of the New York Botanical Garden.

ILLUSTRATIVE MATERIAL OF GAPS AND TRACES IN TEACHING PLANT ANATOMY.

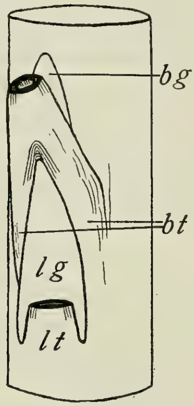
C. L. Wilson.

As every teacher of plant anatomy knows, it is easy to demonstrate leaf and branch gaps as seen in a cross section of the stem. This is usually accomplished by free-hand sections through the stem, the sections being laid out in series until the whole of the gap is seen, from the passing out of the trace to the closing of the gap. Most herbaceous stems will serve for this purpose, as well as some woody stems in which little secondary growth has occurred. Fern rhizomes, particularly those of *Dennstaedtia* and *Adiantum*, are especially effective, since there are no branch traces to confuse the beginning student.

It is not so easy, however, for the beginner to visualize the nodal region of a stem as it would appear in face view with the cortex removed. Such a stem may be found in mullein (*Verbascum Thapsus* L.). In old stems which have been exposed to the action of the weather for a year or longer, it will be found

that the cortex has entirely disappeared. The leaf gaps in such a stem are conspicuous by their size. In the upper regions of the stem in which the gap has not been buried in secondary wood, they may measure from five to ten mm. in height and three to five mm. in width at the base.

The best material which the writer has seen is the decorticated stems of *Decodon verticillatus* (L.) Elliott, an aquatic perennial rather widely distributed in the eastern United States. In this form, which is found on the borders of ponds, the aerial stems die down every year, and commonly lie in the water all winter. The action of the bacteria in the water in removing the pith and cortex may be completed by boiling the stem a short



Nodal anatomy in *Decodon*. bg, branch gap; bt. branch trace; lg, leaf gap; lt, leaf trace.

time in caustic potash. A face view of traces and gaps in this form is seen in the accompanying figure. Although the gaps are small, they may be easily studied with the naked eye. Except toward the base of the slender stems, secondary growth is small in amount, and the branch gap, which is commonly obscured first by cambial activity, is readily distinguished. The leaf trace is single, and the leaf gap extends upward until it merges with the branch gap. The branch trace arises from the sides of this common gap, and unites shortly after passing off from the stele. The condition here illustrated is probably a common one in woody plants.

Dartmouth College

PROCEEDINGS OF THE CLUB.

Meeting of November 26, 1924.

The meeting of this date was held at the New York Botanical Garden. The following were elected to membership in the Club:

Miss Olive Baron, 237 141st Street, Belle Harbor, L. I.
Miss Dorothy Buob, 341 West 50th St., New York, N. Y.
Miss Ella Chessler, 2127 81st St., Brooklyn, N. Y.
Mrs. Lewis B. Fairbanks, Bainbridge, Chenango Co., N. Y.
Mr. Charles Just, 164 Grove St., Passaic, N. J.
Miss Mary E. Reid, Boyce Thompson Inst., Yonkers, N. Y.
Mr. Benjamin O. Towne, 351 East 19th St., New York, N. Y.
Mr. Edward DuVivier, 7 West 42nd St., New York, N. Y.

The resignation of Dr. Isaac Levin was accepted.

Dr. N. L. Britton spoke briefly of the new New York State Museum Bulletin, No. 254, entitled "An annotated list of the Ferns and Flowering Plants of New York State", by Dr. Homer D. House. This work includes records of stations, and bibliographical references to date, making use also of the large amount of material available at the Museum herbarium at Albany. Dr. Britton stated that *Teesdalia nudicaulis* found by Bicknell on Long Island was not recorded. A specimen of this from the herbarium of the New York Botanical Garden was exhibited and Dr. Britton remarked that a record of the find may not have been published. Dr. Britton felt that there were, perhaps, some inconsistencies in the work; e. g. in the Orchidaceae, Dr. House recognizes such genera as Gymnadeniopsis, Limnorchis, Lysias, Blephariglottis, etc., but in the Lentibulariaceae he does not divide Utricularia into the different genera of Barnhart.

"Photoperiodism in Chara" was the title of the talk which followed, by Mr. J. S. Karling. As to periodicity in the fructification of algae, there are two ideas prevalent: either that environmental conditions do not greatly affect the development of sexual organs, and that it is the result of inherent or inherited tendencies, or that the periodicity is entirely determined by external conditions.

Chara fragilis, the species worked with, is said to fruit naturally from June to September. Mr. Karling stated that by prolonging the day with the use of artificial illumination, the development of antheridia and oogonia can be induced abundantly

in a few days, in mid- and late winter. Within wide limits the response is not dependent on the intensity of illumination, under the conditions observed. Other results of the artificial illumination were lengthening of the internodes, shortening of the leaves, reduced branching, etiloation, and a general spindling habit in the plants. Very few of the eggs developed into mature oospores. The experiments indicate also that temperature is a factor of secondary importance in determining the production and functional activity of the sexual organs.

In the discussion which followed, Mr. Karling said that the age of the plants had nothing whatever to do with the production of sexual organs, young and old alike responding to the artificial illumination.

Arthur A. Graves,
Secretary.

Meeting of December 9, 1924.

The meeting of this date was held at the American Museum of Natural History. The program of the evening consisted of an illustrated lecture by Dr. Ephraim Ha Reubeni entitled, "New light on the flora of the Old and New Testaments." Dr. Ha Reubeni said that the translators and expositors of the Bible talk of plants which do not grow at all in places where they are assumed to grow, such as the Urtica, by which they usually translate the *Harul* of Proverbs XXIV, 31. Urtica does not grow in the open fields as is claimed for the *Harul* of this verse. No lily, as such, which might be referred to in "the lily of the fields," grows in Palestine.

Also many flowers highly characteristic of Palestine and conspicuously mentioned in the Bible, have not been recognized by biblical scholars. Examples are the *Kimosh* which is in reality the Ammi (*Ammi Visnaga* and *Ammi majus*). The *Sirim* of the Old Testament is *Poterium spinosum*, found generally in the mountain country. *Zizyphus spina Christi* is the biblical Atad. Bata of Isaiah V, 6, is translated as "waste place." As a matter of fact, Bata is the name of *Vitex Agnus castus* famed of old for therapeutic qualities and found today growing by the side of brooks.

There are plants not mentioned as such in the Bible, but their names have been preserved in the names of persons or places,

e. g. Mayish (*Celtis australis*) which appears in the proper name Mishael. From Refah (*Artemisia monosperma*) one of the descendants of Ephraim is named. *Matricaria aurea* is used by the women of Palestine for a tea taken at childbirth.

During the winter season, which is rainy, the plants have a green, succulent aspect, while in summer, when rain never falls, they have quite a different appearance, some becoming quite hard and thorny. Thus it is that the Psalmist says: Ps. 32:4, "For day and night the land was heavy upon me; my moisture is turned into the drought of summer."

Two oaks are common: *Quercus lusitanica* in the central part of the country and *Q. coccifera* to the southward. The former is the biblical Nahalulim, while the latter is Nazusim.

As to what plant is meant by the lilies of the field, in "Even Solomon in all his glory was not arrayed like one of these," Dr. Ha Reubeni believes for various reasons* that *Anthemis palestina* was indicated.

(An abstract of Dr. Ha Reubeni's address is printed in this issue.)

ARTHUR A. GRAVES,
Secretary.

NEWS NOTES

CHECK LIST OF THE FLORA OF THE VICINITY OF NEW YORK

Local botanists have suggested that a check list of the names in the writer's "Flora of the Vicinity of New York" would be useful on field trips and in checking collections.

Such a list will be prepared if there is sufficient demand for it, at fifty cents a copy, to cover printing and postage. In order to make the list of use to those who are familiar with only one of the manuals, the names used in the "Flora of the Vicinity of New York" and the "Gray Manual" will both be included. There will be, also, symbols indicating where the different species are chiefly found. Additions since the "Flora of the Vicinity of New York" will be included. If interested, write to Norman Taylor, Brooklyn Botanic Garden, Brooklyn, N. Y.

* See Torreya 25: 35–38.

Dr. and Mrs. N. L. Britton with Mr. Kenneth Boynton returned on the thirteenth from Porto Rico with a valuable collection of plants for the New York Botanical Garden.

Dr. Mel Cook of the United States Department of Agriculture spent part of the Christmas vacation at the Botanical Garden.

Mr. Carlos E. Chardon, Commissioner of Agriculture and Labor of Porto Rico spent a few days at the Botanical Garden recently. He is engaged with Dr. F. J. Seaver on a list of the fungi of the Porto Rico.

Dr. John K. Small is in charge of a party travelling by motor truck from Cape Sable around the Gulf and across Texas to El Paso. The party are camping along the way and collecting where conditions seem interesting and will investigate the various floral regions they come to.

The Torrey Botanical Club

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A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

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(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
Brooklyn, N. Y.

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EDITED FOR

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BY

GEORGE T. HASTINGS

John Torrey, 1796-1873

CONTENTS

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2567 Sedgwick Ave.
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TORREYA

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May-June, 1925

A BOTANICALLY REMARKABLE LOCALITY IN THE TALLAHASSEE RED HILLS OF MIDDLE FLORIDA

Roland M. Harper

At the time of the publication of my Geography and Vegetation of Northern Florida, late in 1914,* automobiles were rather a scarce luxury, and exploring by means of horse and buggy was but little better than walking, and my observations in the region designated as the Tallahassee red hills were practically confined to what I could see in walking out from Tallahassee and back the same day, a radius of ten or twelve miles.† Consequently I had never seen Lake Miccosukee, one of the four large shallow lakes of the region, which is about twenty miles northeast of Tallahassee.

In the work cited (page 277) I mentioned the remarkable dearth of rare plants in this region, a region which has no counterpart anywhere else in the world, and ought presumably therefore to have at least a few endemic plants. That statement now requires modification.

Early in January, 1924, I returned to Tallahassee after one of my periodic absences in other states, and found the post of assistant professor of botany at the Florida State College for Women occupied by Dr. Herman Kurz, who possessed an automobile and a fondness for exploring the surrounding country with it. I soon went on trips with him to various places which had previously been out of my reach; and on Monday afternoon, February 18th,‡ we headed for Lake Miccosukee. Dr. Kurz

* Ann. Rep. Fla. Geol. Survey, **6:** 167–437.

† Miss Laura Gano, who studied the vegetation of this neighborhood between 1908 and 1910, and published an account of it in the Botanical Gazette several years later (**63:** 337–372. 1917), was probably even more restricted in her explorations, and did not do justice to any of the large lakes.

‡ Not Sunday as stated in a Science Service news item in Science for Oct. 10, 1924 (and copied in the Literary Digest for Nov. 15). That item seems to have been written by a friend of Dr. Kurz's, who was in Florida at the time of the discovery here described, and had some inside information as well as a little misinformation. (This correction is made for the benefit of the "fundamentalists" and others who might think there was something reprehensible about discovering new species on Sunday.)

had previously been to the west side of the lake, and thought the woods on the other side looked interesting from the distance; so at his suggestion we went around to the northeast side to see what we could find.

Lake Miccosukee is roughly triangular in shape, with an area of about eight square miles, and is all in Jefferson County, but its western shore forms part of the boundary between the counties of Leon and Jefferson. The road we followed ended at a duck-hunter's boat-house known as Dogwood Landing, on the northeast side of the lake about two miles from its northwest corner, and five miles south of the Georgia line. This lake, like others of its class, is shallow enough for maiden cane (*Panicum hemitomon*), various Nymphaeaceae, and other aquatics to grow nearly all over it, and at times it is almost completely dry.* The shallowness of the water, combined with the vegetation, checks wave action and prevents the formation of sandy beaches.

At the point where we first stopped the shore is low, miry, and ill-defined, and bordered by scattered cypress trees, *Taxodium distichum*, which had not been reported from this region before.† With the cypress, or a little farther back from the water but still in miry ground, are the following plants, besides others not easily identifiable when leafless. (They are arranged in approximate order of abundance.)

TREES:—*Acer rubrum*, *Liquidambar*, *Diospyros*, *Quercus nigra*, *Q. Michauxii*, *Melia Azedarach* (introduced), *Celtis* sp., *Salix nigra*.

SHRUBS:—*Cephalanthus*, *Cyrilla racemiflora*, *Styrax Americana*.

WOODY VINES:—*Tecoma radicans*, *Ampelopsis arborea*, *Rhus radicans*, *Parthenocissus*, *Vitis aestivalis* (?), *Bignonia crucigera*.

HERBS:—*Tillandsia usneoides*, *Hibiscus* sp., *Pontederia*.

A little farther southeast along the lake shore, say half a mile from Dogwood Landing, the land rises more steeply from the lake, forming a low bluff or slope perhaps twenty feet high, with a horizontal distance of 100 to 200 feet from the top of the bluff to the edge of the water; and that continues for another

* See E. H. Sellards, Ann. Rep. Fla. Geol. Surv. **3:** 58–61, *pl. 6:* **6:** 130–133, 137; **9:** 124–127, *pl. 8*.

† In Lake Lafayette there is an abundance of cypress, but it seems to be all *T. imbricarium*.

half mile if not farther. From the top of the bluff cultivated and abandoned fields and groves of second-growth pines (mostly *Pinus echinata*) extend northward for an indefinite distance; but the slopes are still wooded with what appears to be virgin forest, except for an occasional chinaberry tree (*Melia*), which sometimes invades rich woods in the South much as *Prunus Avium* does around New York.

Looking southeast along shore of Lake Miccosukee near Dogwood Landing, showing *Pontederia* and *Panicum hemitomon* in foreground, *Taxodium distichum* at left, and wooded bluff in distance. 4:03 p.m., Feb. 18, 1924.

Although the vegetation of the lake shores and bluff includes several species that are rather fond of limestone (such as *Taxodium distichum*, *Ampelopsis arborea*, *Quercus Schneckii*, *Tilia*, *Acer Floridanum*, *Ulmus fulva*, *Cercis*, *Adelia ligustrina*, *Ptelea*, *Arisaema Dracontium*, *Tovara*, *Spigelia*, *Polymnia Uvedalia*, and *Eupatorium incarnatum*), no rock of any kind was seen on the northeast side of the lake, and several borings made on the wooded slope with a three-foot auger by Dr. Kurz revealed

nothing but sandy red clay with a slightly acid reaction, much the same as can be seen on almost any hillside in this whole region. (A chemical analysis might tell a different story, but that has not been possible yet.) Some of the plants also are rather partial to river-banks (e.g., *Taxodium*, *Celtis*, *Salix*, *Calycocarpum*), but we have no evidence that Lake Miccosukee was ever connected with any river. The forest is pretty well protected from fire by the slope of the bluff with water at its base, and there is considerable humus in the soil, but that alone would not account for the luxuriance of the vegetation and the predominance of deciduous trees.* If it were not for the presence of the Spanish moss, *Tillandsia usneoides*, any one entering this forest in twilight could easily imagine himself to be somewhere in Ohio or Kentucky.

On account of the very interesting vegetation, and especially one plant which will be referred to more particularly below, I made four more visits to the place in 1924, in March, April, May and December. Being out of the state from the middle of May† to the first of November, I had no opportunity to study the summer and fall flora, and have probably missed a few species that are not recognizable in winter and spring. But such an opportunity cannot be counted on this year either, so it seems desirable to place on record some of the facts about this very interesting locality without waiting for a more complete list of plants.

The following list applies only to the wooded bluff slopes on the northeast side of the lake, and not to those on the west side‡ or to the miry lake shores, which have already been discussed. The plants are divided into large trees, small trees, woody vines, shrubs, and herbs, and arranged as nearly as possible in order of abundance in each group. Evergreens are indicated by heavy type, and introduced species by parentheses.

* See Bull. Torrey Club **41:** 218–219. 1914.

† See Torreya **24:** 77–83. Oct. 1924.

‡ The sink or subterranean outlet of the lake, which is on the west side about opposite Dogwood Landing, was visited by the writer with Dr. Kurz and Mr. Coville on March 2, 1924, and found to be at the foot of a steep wooded bluff, but on and around this bluff we saw practically no lime-loving or other specially noteworthy plants, and the flora was about the same as in any moderately rich woods in the Tallahassee red hills.

LARGE TREES

Quercus Schneckii (?)	Prunus serotina
Quercus Michauxii	Celtis sp.
Liquidambar Styraciflua	(Melia Azedarach)
Tilia sp.*	**Quercus Virginiana**
Fraxinus Americana	Hicoria sp.
Acer Floridanum	**Pinus Taeda**
Ulmus fulva	**Magnolia grandiflora**
Ulmus alata	

SMALL TREES

Prunus Caroliniana	**Persea Borbonia**
Cercis Canadensis	Morus rubra
Ilex opaca	

WOODY VINES

Bignonia crucigera	Rhus radicans
Parthenocissus quinquefolia	Vitis rotundifolia
Smilax rotundifolia ?	**Smilax lanceolata**

SHRUBS

Grossularia echinella	Callicarpa Americana
Adelia ligustrina	Ptelea trifoliata
Aesculus Pavia	Asimina parviflora

HERBS

Tovara Virginiana	Polymnia Uvedalia
Calycocarpum Lyoni	Oplismenus setarius
Tillandsia usneoides	Eupatorium incarnatum
Arisaema Dracontium	**Polypodium polypodioides**
Spigelia Marilandica	Trillium Underwoodii
Tradescantia sp.	

The most remarkable thing about the vegetation (disregarding the identity of the species) is the fact that the first evergreen tree comes twelfth on the list, and there seem to be no evergreen

* In the last few years, since the splitters have been at work on this genus, it is practically impossible to identify the described forms in the field without a manual, or in winter even with a manual (much as in *Crataegus*). They all have much the same bark, wood, flowers and habitat, and the 15 alleged species and several varieties described in the 1922 edition of Sargent's Manual of North American trees are distinguished mainly by the pubescence and serration of the leaves. The 17 *Tilia* cuts in that work do not show any important differences, and there is possibly no one who could identify them all if they were separated from the accompanying text. Such forms cannot be distinct species in the same sense as those of *Pinus*, *Quercus*, etc., now commonly recognized.

shrubs. There are more evergreens among the small trees and vines, but it is probably safe to say that not one-tenth of the vegetation is evergreen; which can hardly be said of any other equal area in Florida, outside of the alluvial bottoms of the Apalachicola River. Elsewhere I have found a correlation between scarcity of evergreens and abundance of potassium compounds in the soil,* but whether or not that will hold here we have no direct evidence yet.

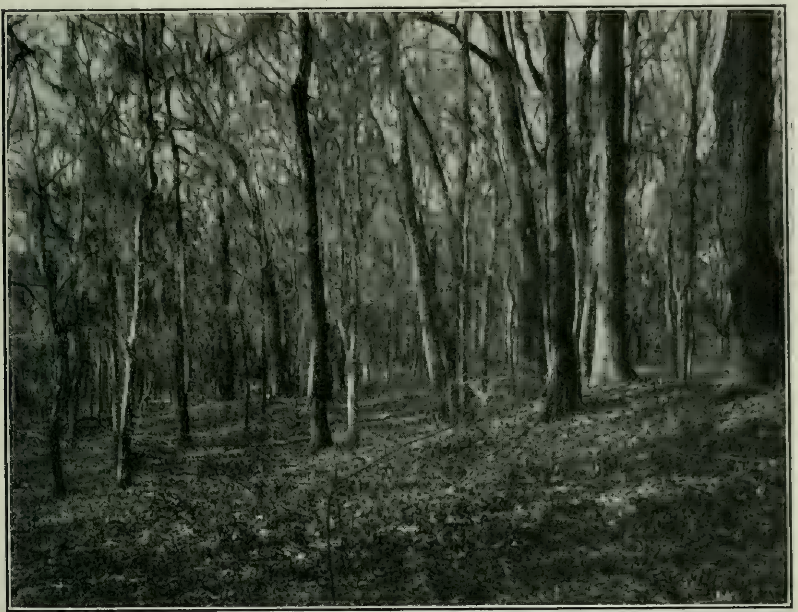
Neither Ericaceae nor Leguminosae were observed, for the former seem to avoid lime and potash and the latter humus; but some of the latter might possibly be found in summer. Until a more complete list of plants is available it is hardly worth while to discuss the families most largely represented, the prevailing flowering seasons, colors of flowers, modes of dissemination, etc.

Taxodium distichum, *Ulmus fulva*, *Adelia*, *Ptelea*, *Tovara*, and *Calycocarpum* had not been reported from this region before, but most of them can be found on the Apalachicola River bluffs or in the Marianna red lands farther west. By far the most interesting plant in the list is *Grossularia echinella*. Although it is more abundant in the area under consideration than all the other shrubs combined, it is not known anywhere else in the world, and not described in any book; and therefore some particulars about the circumstances under which it was found will be of interest.

Soon after entering the rich woods southeast of Dogwood Landing with Dr. Kurz on the date named (Feb. 18, 1924) I was surprised to see a few specimens of a currant or gooseberry (both of which were formerly included in the genus *Ribes*). Although no such plant had been found anywhere near Florida before, at first it did not occur to me that it might be an undescribed species, and I was inclined to refer it to *Ribes* (*Grossularia*) *curvatum* Small, whose nearest known stations were Stone Mountain, Georgia, and the mountains of Alabama, over 200 miles away and in a perceptibly cooler climate. Its leaves were then about half grown, and we guessed that it would be in bloom about two weeks later. As the afternoon was then well advanced, we did not go more than a quarter of a mile or so into the forest after finding the first specimens of the gooseberry,

* See Bull. Torrey Club **40:** 398–399. 1913.

but the farther we went the more abundant it became; and in May, about half a mile farther in the same direction, we found at least an acre in deep woods a little farther from the lake so densely covered with the same plant that it was difficult to walk through without tearing one's clothes on the sharp thorns.



Rich woods on northeast side of Lake Miccosukee about one-half mile southeast of Dogwood Landing, showing *Fraxinus Americana*, *Quercus Schneckii*, etc. 4:28 p.m., March 2, 1924. *Grossularia echinella* occurs near by, but does not happen to appear in this view. Note the scarcity of shrubs and evergreens. It is interesting to compare this with fig. 5 in Geol. Surv. Ala Monog. 8 (1913), taken on a limestone slope in the Tennessee Valley, and fig. 42 in 6th Ann. Rep. Fla. Geol. Surv. (1914), taken on a limestone slope in West Florida. All three pictures were taken in March, when most of the trees were leafless, and a few plants are common to all three places.

On February 29th Mr. F. V. Coville arrived in Tallahassee for a brief visit on his way to West Florida, and as he had done considerable work with the Grossulariaceae I told him of our find, and of our plans to visit the place again soon to look for flowers, and he readily accepted an invitation to go along. On March 2nd we revisited the spot and found the gooseberry in bloom,

and Mr. Coville almost immediately pronounced it a new species. (He described it as soon as possible thereafter,* without even waiting to learn the color and taste of the ripe fruit which was not available until June.) Dr. Kurz and Mr. Coville went there again about four weeks later, and on April 22nd I conducted Dr. John K. Small and his party to the spot, and

Looking across a slough near Lake Miccosukee about ¾ mile southeast of Dogwood Landing. Trees in foreground mostly *Fraxinus lanceolata* (?). On slightly higher ground just beyond can be seen the edge of a dense mass of *Grossularia echinella* covering an acre or more. 5:40 p.m., May 10, 1924.

found the fruit about two-thirds grown. Dr. Kurz took Dr. Frank Thone and two entomologists from the University of Florida there on April 27th, and me again on May 10th, and Mr. Coville went to the place from Thomasville, Ga., late in June to get the ripe fruit. Dr. Kurz was there again in October, and he and I together on December 15th.

* Jour. Agric. Research **28:** 71–74, *pl. 1.* "April 5" [June] 1924. If the specific name is a substantive it should be written *Echinella;* and if it is an adjective those who do not separate *Grossularia* from *Ribes* will write it *echinellum.*

Some weeks before *Grossularia echinella* was formally described, news of the discovery got into several Florida newspapers, and led many people to imagine that because it was something new it must necessarily be valuable (unmindful of the fact that nearly all our food plants have been known for centuries, and we did not even know at that time whether this gooseberry was edible or not). This brought several requests from perfect strangers for living plants, but naturally we did not care to make such a long journey to accommodate them, and incidentally contribute to the extermination of a very rare plant before it was even named. Several people also bobbed up with stories of gooseberries they had seen in other places not far away, but all such reports proved to pertain to the genus *Polycodium* (Vacciniaceae), the species of which are commonly known as gooseberry in the South.

A brief description of *Grossularia echinella* may be of interest to readers who do not have access to Mr. Coville's publication. It is a shrub three or four feet tall when full grown, with slender arched stems which often take root where they touch the ground. The leaves are much like those usual in the genera *Grossularia* and *Ribes*, (palmately lobed, as in several other families of Polypetalae), and there is a pair of sharp stipular spines at every node. The ovary, calyx-tube or hypanthium (as it is variously interpreted) when in flower is densely covered with soft green spines, which as the fruit develops become larger and farther apart, but hardly stiff enough to cause serious discomfort if one wishes to bite into the berry. When full grown the berry is about an inch in diameter, and somewhat intermediate in appearance between a small chestnut burr and a green jimson weed pod. It is the largest and spiniest of any American species of the genus. The spines number perhaps two or three hundred to the fruit, and are gland-tipped.

Another peculiarity of this species is its leaf development. According to Dr. Kurz, when he visited the place last October the bushes were practically leafless, but new leaves were just beginning to show. At the middle of December they were flattened out and approximately half grown, just as they were in February. So apparently the leaves remain half developed through the winter and complete their growth in spring, unlike any other deciduous shrub known to me. Just what effect a

severe freeze has on them remains to be seen. At the time of the first discovery it was just six weeks after a minimum temperature of about 16° F. in Tallahassee, which killed many cultivated woody plants to the ground; and it is possible that the leaves we first saw had all come out since that freeze.

The inhabitants within several miles of the place seem to be all negroes, and we have not yet heard that any of them know any name or use for *Grossularia echinella*, although according to Mr. Coville its fruit is sweet and juicy. * But we have not talked about it much locally, for fear of giving the impression that it is something valuable and thus causing a raid on it. Several specimens that have been transplanted to yards in Tallahassee are growing nicely.

TALLAHASSEE, FLORIDA.

FURTHER NOTES ON CALYPSO

HENRY MOUSLEY

I have found an Orchis:
"What of that?" you say,
T'is a proof that miracles
Happen every day.

The above lines, I believe, are attributable to Mrs. Talbot Clifton, the authoress of "Pilgrims To The Isles of Penance," "Orchid gathering in the East", or as it was to have been called, "The Orchid Pilgrimage," and I have chosen them as being a somewhat appropriate heading to this further paper on the underground development of Calypso. In my first article on the subject—see the "Journal of the New York Botanical Garden" for February 1924—it seemed to me that I had covered the ground fairly well, but even after years of patient research, it is no surprise to the orchid hunter to find new wonders awaiting him, not only above, but below ground also. It is in the study of the latter phase more especially, that I am meeting with new

* SUPPLEMENTARY NOTE. Dr. Kurz visited the locality on June 2, 1924, a few days before leaving Florida for the summer, and found the gooseberries not quite ripe. But Mrs. Kurz gathered some of them, and the next morning made from them some jelly, which in both color and taste was very similar to apple jelly.

surprises, not exactly every day, but so frequently, as no doubt to justify my use of the above lines of Mrs. Talbot's, and the further recording of my experiences with Calypso during the year 1924.

As most people will no doubt remember, the month of May was anything but warm, in consequence of which, Calypso was somewhat behind time in making its appearance, and it was not until the 25th, that it could be said to be fully out, this being a week behind the average time for the past six years. On the 18th, I was fortunate in discovering a fourth station for the species, containing nine plants, and again on the 22nd, a fifth station of five plants, one of which was a lovely snow-white example. I have already referred to the fact, that if Calypso depended entirely upon its seeds for propagation, it would very soon become extinct, which fact was again forcibly brought to my notice, for out of fifty plants examined this season, three only bore capsules, one of which will be seen in our plate Fig. No. 1, the capsule bearing the persistent perianth, together with another capsule Fig. No. 1a, from one of the other two plants. These were found on August 2, and at that date had dehisced as can be seen. Figures Nos. 2 and 8, are interesting as showing the development of two new buds, one on each side of the old tuber, in place of the usual single one. This producing of two instead of the usual single bud, appears to be not uncommon, several examples having come under my notice, one of which has already been shown in my previous paper Fig. No. 3, and the other will be touched upon later as Fig. No. 10 in the present plate. We now come to Figures Nos. 3 and 4, probably the most interesting of the whole series, and kindly sent me by my friend Mr. L. M. Terrill of St. Lambert, Que., he not knowing at the time, what was hidden away in the earth surrounding these plants, which were intended I should transplant at Hatley. They came from near Metis, on the northern shore of the Gaspé Peninsula, and were collected on June 21, 1924, in somewhat dry coniferous woods. Now Irmisch, "Beiträge Zur Biologie und Morphologie der Orchideen," Leipzig, 1853, as I have previously mentioned has described the tuber as consisting of two internodes, or sometimes of only one, below the leaf, and this I have always found to be the case, until I examined the two plants in question, which clearly have three internodes de-

veloped. Moreover, in Fig. No. 3, which brings out this point more forcibly than Fig. No. 4, it will also be seen, that the old tuber (1923) is actually producing a bud similar to the tuber of 1924, such a thing I have never come across before, and I have examined some hundreds of tubers, which can be done in most cases—I am glad to say—without uprooting them. This bud it will further be seen, is developed on the basal or third internode, the tuber being of a round nature, whereas, the one for 1924, is somewhat slender and elongated. The more general rule, I think, is for the succeeding tubers to be similar in shape to the preceeding ones, which is well exemplified in figures Nos. 5 and 10, more especially No. 10 and Figs. 3, 4 and 5 of plate No. 2, of my previous paper. In Fig. No. 6, we get another instance of a bud appearing on the old tuber. The cause of this phenomenon, I think, lies in the fact of the plant's habitat, somewhat dry coniferous woods, in place of the usually damp situations that Calypso favours. This is conducive to the preservation of the old tubers, which in some cases apparently, contain an amount of vitality in the second year sufficient to produce a bud, even if this bud never comes to maturity, which is questionable. In further reference to this matter of preservation, I might state, that I have photographs of two plants of Liparis Loeselii, found growing on very dry ground—which is unusual for this species—that show signs of four and five generations of tubers, still remaining, a thing almost impossible in the very wet situations I usually find the species, where signs of three generations are uncommon. Figs. Nos. 7, 9, 11 and 12, show the very early stages of the plant's existence, Fig. No. 9, having the coralloid palmate body or rhizome accompanying the tuber, as mentioned by Liboschitz and Trinius, in their "Flore des Environs de St. Petersbourg et de Moscov," 1818, p. 214, finer examples of which will be seen in my previous paper.

Fig. No. 12, is an interesting little plant, with its very small leaf and no doubt first flower bud in evidence Aug. 2, on which date the other three small plants were collected. Figure No. 10, has already been alluded to in connection with the tubers resembling one another so nearly, but it is a good example also, of how one might have been deceived on finding the plant in 1925, into imagining that it represented five generations, where-

as it would really only represent three. This plant was collected on June 21, but was first found on May 18, with two others closely appressed to it, thus forming a little bunch, which eventually bore four blooms, the largest number I have ever found close together at Hatley, the plants as a rule being distributed singly, over a somewhat wide area, in direct contrast to the conditions existing near Metis, where Mr. Terrill tells me he found as many as fifty blooms, in an area of about ten square feet. Baldwin in his "Orchids of New England," 1884, p. 50, speaks of Prof. Scribner, of Girard College, having once found in Maine, as many as fifty plants in bloom, in a space not a foot square.

We now come to the last figure of all, No. 13, depicting a plant growing in, and surrounded by a mass of white web-like, or lace-like fungus growth—mycelium—which threads through the earth and decaying wood—as can be seen—forming an alliance with the orchid, which has been termed luxury-symbiosis, an association that has been regarded as harmful to the orchid, but which in reality is exactly the opposite, so far as I have been able to judge. In connection with this most interesting phase of orchid life, I quote the following from a paper by Prof. Oakes Ames in the "Orchid Review," Aug. 1922, Entitled, "Observations on the Capacity of Orchids to Survive in the Struggle for Existence," viz., "Another peculiarity of the Orchids that inclines us to believe that decadence is not a purely hypothetical condition is their dependence on mycorrhiza. It has been claimed that the orchid seed, under natural conditions, is incapable of passing beyond the embryonic stage unless invaded by the hyphae of a mycorrhizal fungus. When the seeds are disseminated they lie dormant until association with the necessary fungus is established. Whether or not there are numerous exceptions to this peculiarity has little to do with the case from the point of view taken by those authors who would have us believe that the Orchids are on the decline as a biological group." In several recent issues of the "Orchid Review," there have been papers on this subject of luxury-symbiosis, experiments having been carried out by several growers—of hothouse plants—in which they have demonstrated that it is possible to rear seeds successfully without the aid of any fungus whatsoever, but in nature unadulterated, I have always found that where there is

an abundance of mycorrhizal fungus, there surely, will one find, not only a greater number, but larger, richer, and more hand-

some plants as a rule. Even the one in question, i.e. Fig. No. 13, bears out my contention in a minor way, for on the date it was gathered, Aug. 21, it was well ahead of most others, as regards

the development of the leaf and flower buds, more especially the latter. This experience seems to be in accord with that of Prof. Oakes Ames, judging from his paper, "The Mycorrhiza of Goodyera Pubescens," Rhodora, Vol. 24, March 1922, pp. 37–46, in which he refers to his studies of colonies of Goodyera (now Epipactis) pubescens, which colonies he says are the result of seeds falling near mature plants, where mycorrhizal fungi are generally most in evidence, and where they germinate readily. Seeds which drift away on air currents or are blown abroad by the wind and fall where there is no nidus of the necessary fungus, fail to germinate. Otherwise, how account for the colony forming tendency of the species and the peculiarities of distribution.

Before closing, it may not perhaps be out of place to mention, that in the latest book on Orchids, "Enumeration of the Orchids of United States and Canada," by Prof. Oakes Ames, April 23, 1924, it will be noticed that in the Key to the genera, Calypso is placed among the species that have a simple rhizome. Writing to me on the subject July 2, 1924, Prof. Oakes Ames says, "I think this is right for the ordinary run of specimens one finds. The coralloid character to which you have drawn attention seems to be rare. Your notes had not come to my attention in time to make a straddle." Whilst agreeing to this in the main, I might say, that my further studies of Calypso incline me to the belief that this coralloid character is not so rare as at first surmised, especially where the plants are found growing on dead logs, stumps, or small branches of trees which are in a state of decay, as I have previously pointed out in the "Journal of the New York Botanical Garden," vol. 25, 1924, p. 28. The photographs from which the plate has been made were taken by the Geological Survey at Ottawa, and I am again indebted to Dr. M. O. Malte for them.

Hatley, Quebec.

An Additional Anychia from Pennsylvania.—In the early part of the past century Rafinesque described a half-dozen species of *Anychia*. Specimens of these species, distributed by Rafinesque himself, and now extant, show that they represent either *Anychia canadensis* or *A. dichotoma*. Recently specimens of a plant novelty have come to hand. They represent a species

of *Anychia*—an extreme end of the genus, so to speak. This new species may be named, for the discoverer, Lawrence William Nuttall, and described, as follows:

Anychia Nuttalli Small, sp. nov. Annual, 7–23 cm. tall, stem erect, usually simple below, dichotomously corymbose above and often with some short lateral branches, closely pubescent with short recurved hairs, brown, nodes swollen: stipules scarious, lanceolate, 2–3 mm. long, acuminate: leaves opposite, early turning brown; blades linear-elliptic to linear and often slightly-broadened upward, 0.5–1.5 cm. long, mostly acute, ciliate, otherwise glabrous, at least on their upper side, nearly sessile: hypanthium very short: calyx short-petioled, yellowish-green 1.5–2 mm. long; sepals narrowly elliptic, 3-veined, narrowly scarious-margined, hooded at the apex, but terminating in a short spine-like cusp, which extends beyond the hood: stamens about half as long as the sepal-bodies; filaments subulate; anthers didymous, much shorter than the filaments: style very short; stigmas about as long as the style: utricle lenticular, suborbicular, about 1 mm. in diameter, somewhat flattened at the top: seed yellow lenticular, less than 1 mm. in diameter.—Blue Ridge Summit, Adams County, Pennsylvania.

About the middle of August the writer received specimens of an odd-looking forked-chickenweed from Mr. Lawrence W. Nuttall, which he had just collected in the mountains of southern Pennsylvania. In answer to a request for more specimens Mr. Nuttall wrote:

"I am sending you more specimens of the plant as requested in your letter of the 25th. The plant grows in an old field, stony and weed grown, but apparently cultivated within the last few years.

"The plant grows in association with orange-grass, clammy-cuphea, pennyroyal, etc. The field slopes toward the south, and I could not find it in a similar field next to it but facing the north.

"It is scattered about all over the field, though the largest specimens were found this morning [August 26th] at the east end of the field where they are protected from the early morning sun. These I sent."

The species just described differs from *Anychia dichotomia* in

the larger yellow-tinged calyx, and the sepals which are more strongly hooded and terminate at the back of the hood in a spinelike cusp. The latter structure is a characteristic not before known in the genus.

JOHN K. SMALL.

THE NEW YORK BOTANICAL GARDEN.

BOOK REVIEW

CURTIS'S "A GUIDE TO THE TREES." *

There is no dearth of tree books, but Professor Curtis's "A Guide to the Trees" is aimed particularly at young folks in their teens and, so far as known to the present reviewer, no other work brings out the distinctive characters of the trees of our northeastern states in such simple and non-technical language. Keys to the genera are supplemented by keys to the species in the larger genera. Each of the species is illustrated by a good text-figure and other figures are found in the keys and in the brief glossary. The Latin names, which are made subsidiary to the "common" English names, appear to be in harmony with the recently published Standardized Plant Names prepared by the American Joint Committee on Horticultural Nomenclature. The importance of the trees to the life of our nation and the need for treating them with intelligence and respect are properly emphasized by the author. It is a book that will prove most useful to Boy Scouts and Girl Scouts in their nature-study work and it breathes a spirit that the Scout movement is doing much to foster.

If one were to mention flaws in Professor Curtis's book, the most conspicuous may be the existence of unorthodox spellings of certain generic and specific names—spellings which do not appear to be altogether the result of hasty proof-reading, as they appear in the index as well as in the main text. Such are the unconventional but easily recognizable variants of *Asimina*, *Castanea*, *Cerasus*, *Halesia*, and *Ptelea*. But these will doubtless be set right in the second edition which a lively demand may soon make necessary.

MARSHALL A. HOWE.

* CURTIS, CARLTON C. A Guide to the Trees. Small 8vo. Pp. 1–208. 1925. Greenberg, Publisher, Inc., New York.

PROCEEDINGS OF THE CLUB

Meeting of January 13, 1925.

The meeting of this date was held at the American Museum of Natural History.

The following were elected to membership: Mr. L. W. Nuttall, Brickell Apts., Miami, Florida; Dr. Valdimir A. Shternov, 350 West 154 Street, New York, N. Y.; Miss Martha Gertrude Buhofer, 523 West 121 Street, New York, N. Y.

Three resignations were accepted: Miss L. M. F. Allabach, Dr. B. O. Dodge, Dr. Francis W. Pennell.

According to the usual program of the annual business meeting, the reports of the various officers for the year were next received.

The Secretary reported that 15 regular meetings of the Club had been held during the year, with a total attendance of 393, an average of over 26 per meeting. Thirty-six new members were elected in 1923; 17 were lost through resignation. The present membership is 302.

In the report of the Editors of the Bulletin, presented by Dr. T. E. Hazen, it was stated that Volume 51 contained 502 pages exclusive of volume index and 13 plates. It was recommended that in the future only 9 numbers a year be published, omitting the months of July, August and September.

The Editor of Torreya, Mr. George T. Hastings, reported the publication of six bi-monthly numbers, aggregating 114 pages.

Dr. Michael Levine, the Business Manager, reported that from 8 regular advertisers there was an income of approximately $130.

Rev. Dr. H. M. Denslow, Honorary Custodian of the local herbarium of the New York Botanical Garden, stated that during the last three years the additions amount to 3200 sheets.

Dr. M. A. Howe, Delegate to the Council of the New York Academy of Sciences, reported upon attendance at meetings of the Council.

The Chairman of the Field Committee, Mr. A. T. Beals, reported that 37 meetings were held during the year with an average attendance of 12 persons. One of the most interesting trips was a visit to the Ice Gulch and Sunken Garden on Shawangunk Mountain east of Ellenville, N. Y., on Saturday and

Sunday, July 26 and 27. Here, with the temperature in the exposed parts of the mountain in the neighborhood of 85°, the shady parts of the ravine showed patches of snow and ice.

Dr. N. L. Britton, Chairman of the Local Flora Committee, was unable to be present, but sent a check of $100, to be used by the Club for any purpose which the Club deemed advisable. Dr. Britton was given a vote of thanks by the Club and it was moved that the money be added to the permanent funds of the Club.

Apropos of the election of new members, the president informed the Club that Miss Mann had found it necessary to hand in her resignation thus terminating her remarkably efficient record as treasurer. The following officers for the ensuing year were then elected: *President*, Dr. H. M. Richards; *Vice-Presidents*, Dr. John Hendley Barnhart, and Dr. C. Stuart Gager; *Secretary*, Dr. Arthur H. Graves; *Treasurer*, Dr. R. C. Benedict; *Editor*, Dr. Tracy E. Hazen; *Associate Editors*, Dr. Alexander W. Evans, Dr. H. A. Gleason, Dr. Alfred Gundersen, Mr. G. T. Hastings, Dr. Marshall A. Howe, Dr. M. Levine, Dr. A. B. Stout and Dr. C. L. Carey.

The secretary was authorized by the Club to write a congratulatory letter to Gen. T. E. Wilcox, who has been connected with the Club since 1879.

Arthur H. Graves,
Secretary.

Meeting of January 28, 1925

The meeting of this date was held at the Museum Building of the New York Botanical Garden.

The Secretary read a communication from the Institute Jaczewski at Leningrad announcing the celebration on February 8 of the completion of thirty-five years of scientific work by Dr. W. Tranzchel as well as twenty-five years of his service as Conservator of the Botanical Museum at the Russian Academy of Sciences.

The Budget Committee, Dr. Barnhart, Chairman, offered the following estimates for 1925:

Estimated Income		*Estimated Outgo*	
Members' Dues	$1500.00	Bulletin	$2000.00
Bulletin	1000.00	Editor (Bulletin)	100.00
Torreya	150.00	Torreya	500.00
Memoirs	100.00	Index Cards	400.00
Index Cards	600.00	Treasurer	150.00
Interest	150.00	Bibliographer	150.00
Advertising	100.00	Sundries	150.00
Sales	100.00		
Total	$3700.00		$3450.00
		Bulletin (from surplus)	600.00
		Total	$4050.00

The report of the Budget Committee was adopted by vote of the Club.

Dr. Small then described some of his work on Irises. The original home of the Irises in the southeastern part of the United States was in the land now represented by the southern part of the Southern Appalachians. The land between this region and the Atlantic was submerged in the pleistocene. Since the subsequent emergence of the land the species have migrated in all directions. Florida is a very favorable field for Iris exploration. 12 or 14 species occur in the eastern United States. Water colors of the various species were shown.

Arthur H. Graves,
Secretary.

Meeting of February 10, 1925

This meeting was held at the American Museum of Natural History.

The following were elected to membership in the Club: Mrs. Ernest H. Wilson, 37 Forest Ave., Caldwell, N. J.; Mrs. Spencer S. Marsh, Kalmia Lodge, Madison, N. J.

It was announced that two members had been lost by death. Mr. E. B. Chamberlain, a member since 1907, died on February 2. He was for twenty years a teacher at the Franklin School for

Boys, New York City, and greatly beloved both by pupils and faculty. He was also a well-known bryologist, having been Secretary-Treasurer of the Sullivant Moss Society for many years.

Mr. E. P. Bicknell died on February 9. His membership in the Club dated from January 30, 1880, a period of 45 years. During this time he contributed 56 papers to the Bulletin of the Torrey Club and about a half-dozen to Torreya. He took an active interest in the affairs of the New York Botanical Garden, and was for many years connected with its management. Mr. Bicknell was for many years one of the most active members of the Club and his death is recorded with great regret.

The scientific program of the evening consisted of an illustrated lecture entitled "Some Points of Interest Concerning Hemlock," by Major Barrington Moore. The importance of the Hemlock (*Tsuga canadensis*) for the tanning industry, for paper pulp, and also for lumber, as well as its aesthetic value were mentioned. The method of seed distribution is interesting, the cones closing in wet weather, and opening in dry. At each dry period a few more seeds drop out, thus spreading the distribution period over the entire winter. Mossy logs and stumps seem favorable seed beds: the ground cover of decaying needles seems unfavorable. Hemlock is very tolerant of shade. It likes moist sites, but grows on rocky ridges which seem dry. Probably they have moisture near the surface. It is rather shallow-rooted. The rate of growth is more rapid than formerly supposed, and compares favorably with oak, but is not nearly so rapid as white pine. As to temperature, its preference is for a comparatively cool average.

As regards the hemlock grove in the New York Botanical Garden, Major Moore stated that it was of scientific interest because it was the southernmost grove of extensive size near the coast; although, as noted by Dr. Kelly, of Rutgers University, there are trees along the Raritan near the coast. The present lack of reproduction in the New York Botanical Garden grove was discussed. The cause is not known for certain, but may be due to trampling by increasing numbers of visitors or to the absence of mossy logs and stumps. In summarizing the field studies of the Botanical Garden Committee, Major Moore noted the narrow ranges of evaporation and temperature of

hemlock sites which are in general drier than those of hardwoods, with the soil temperature a little cooler.

In the discussion which followed, Major Moore stated that 3,600 trees were counted in the New York Botanical Garden grove in the spring of 1923. He knew of no other previous census. Mr. Taylor mentioned the occurrence of *Tsuga canadensis* at the head of Little Neck Bay, L. I., and also at Wading River—in the former place in a fairly large quantity.

Arthur H. Graves,
Secretary.

Meeting of February 25, 1925

The meeting of this date was held at the Museum Building of the New York Botanical Garden.

The following persons were elected to membership in the Club: Dr. Sam F. Trelease, Columbia University, New York, N. Y.; Mrs. R. S. P. Trowbridge, 540 West 123rd St., New York, N. Y.; Mrs. Helen S. Hill, Brooklyn Botanic Garden, Brooklyn.

The resignation of Miss Helen M. Carr, of Bradford, Vt., formerly of Mount Vernon, N. Y., was accepted with regret.

In regard to the amendment to Section II of the Constitution proposed at the meeting of February 10, whereby the phrase "not to exceed eight in number" which follows "associate editors" be removed. Dr. Howe moved its adoption. As explained by Dr. Hazen, this amendment would remove the limitation in the number of the associate editors which for various reasons is not now advisable. The amendment was adopted by unanimous vote of the Club. Dr. A. F. Blakeslee was reelected to the Board of Editors by vote of the Club.

The Secretary was instructed to cast a ballot for the election of Mrs. Helen S. Hill as bibliographer for the year 1925.

The scientific part of the program consisted of a talk by Dr. Hazen on Plants of the Red Snow.

Formerly there was supposed to be only one "red snow" plant; namely, *Sphaerella nivalis*, so named by the Swedish botanist, Sommerfelt, in 1824. The type material came from Greenland and was reported by Capt. John Ross in 1819 in his "Voyage of the Discovery . . . for Exploring Baffin's Bay and Inquiring into the Probability of a North-west Passage." Ross

figures and describes many crimson-splashed vertical cliffs on the west coast of Greenland and says the snow was red to a depth of 10 to 12 feet, which statement, however, may be taken with a grain of salt. In the same year of the publication of Ross' account, the plant was named *Uredo nivalis* by Bauer of Kew. Then Sommerfelt, in 1824, recognized it as an alga and called it *Sphaerella nivalis*. In 1896, Chodat, in studying the red snow of the Alps, indicated that this was not congeneric with the red rainwater species, *Sphaerella lacustris*, but that it was more like Chlamydomonas, and Wille actually made the transfer to Chlamydomonas, in 1903, assuming that it was identical with the Sphaerella of Greenland. The genus Sphaerella has the central mass of protoplasm united to the outer wall by threads of protoplasm. We do not know whether the Greenland species has these threads, because it has always been studied in its quiescent stage. There is, then, at present no sufficient evidence for the assumption of the identity of *Sphaerella nivalis* of Greenland with *Chlamydomonas nivalis* of the Alps and the Scandinavian mountains.

Red Snow in North America has been reported in the Rockies, the Selkirks and the Sierra Nevada, and has also been assumed without evidence to be the same species as that found in Greenland.

In Norway in 1920 Dr. Hazen found three species causing this phenomenon or red snow: (1) *Chlamydomonas nivalis* Wille, (2) The little known *C. lateritia* (Wittr.) Lagerheim, and (3) an entirely undescribed species, which is the chief occasion for this paper. Fortunately he found this new species in the motile stage and determined the presence of 4 flagella instead of 2 as in Chlamydomonas. It is somewhat similar to the genus Carteria, which, however, has its 4 cilia coming from only one point, while in the new form the cilia are inserted separately, somewhat distant from each other. A similar plant, green in color, had been described in 1876 by Archer as a form of Chlamydomonas and in 1883 it was named Tetratoma by Bütschli. The red species discovered by Dr. Hazen at Haugastøl, Norway, is therefore apparently new and served to confirm Bütschli's hitherto rather doubtful genus.

In the discussion which followed Dr. Seaver remarked that mycologists had experienced some difficulty with Sphaerella

because this was also the name of a fungus. The latter is now changed to Mycosphaerella.

Arthur H. Graves,
Secretary.

NEWS NOTES

Dr. Roland M. Harper, whose article on Tallahassee, appears in this issue, is at present in Florida in charge of tabulating the state census. He, of course, manages to do a little botanizing during his spare time. Early in April Dr. Small and Dr. Wherry on their auto trip from Miami to El Paso stopped for a day's visit with Dr. Harper. Later Prof. L. H. Bailey stopped at Tallahassee and did some collecting of species of Rubus in the neighborhood. Prof. P. H. Rolfs, home for a visit between engagements in Brazil, was also a visitor.

On the 21st of May five busts were unveiled at the Hall of Fame, New York University. Among these was one of Dr. Asa Gray, the gift of The Gray Herbarium, Harvard and friends and relatives of Dr. Gray. Professor Benjamin L. Robinson, curator of the herbarium made an address and a tribute by President Eliot was given by phonofilm. In the tribute Dr. Eliot said "His reputation at home and abroad was much larger than that of a botanical specialist. He was recognized as a clear thinker and strong writer on philosophical and religious themes. Asa Gray enjoyed the satisfaction of having rendered a great and lasting service to his countrymen and to mankind. He knew that he had done much to diffuse among his countrymen a knowledge of botany and a love for it."

During the last of June a two-weeks school of Nursery Fruit Tree Identification was held at Geneva. The course was designed to enable horticulturists to recognize the varieties of cultivated fruit trees at any time of year.

Dr. Susan P. Nichols, Associate Professor of Botany at Oberlin College, has been spending part of a sabbatical year in research at the botanical laboratory of Columbia University, continuing her investigation on the reactions of plant cells to wounds.

The Torrey Botanical Club

Contributors of accepted articles and reviews who wish six gratuitous copies of the number of TORREYA in which their papers appear, will kindly notify the editor when returning proof.

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Phycomycetes: A. F. Blakeslee
Myxomycetes:
Yeast and Bacteria: Miss. J. Broadhurst
Insect galls: Mel T. Cook

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

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A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

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Correspondence relating to the above publications should be addressed to

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Brooklyn Botanic Garden,
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BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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TORREYA

Vol. 25 No. 4

July-August, 1925

SKETCHES OF TRAVEL IN SOUTH AMERICA—THE ASCENT OF CORCOVADO

William A. Murrill

The weather being perfect on Monday, January 28, I decided to devote the afternoon to Corcovado, which is 2,300 feet high and gives a superb view of Rio and the surrounding country. Leaving the "Van Dyck" as soon as lunch was over, I took a trolley car at the Hotel Avenida marked "Aguas Ferreas," which landed me in thirty minutes at the Cosme Velho station at the base of the mountain. Here I found an electric cogwheel train waiting and we were soon on our way up the steep incline, winding in and out among lofty cliffs covered with ferns and catching beautiful glimpses of the forested slopes and the city below. The railway is two miles long, with a maximum grade of 30 degrees. A return ticket costs 3 mil reis,—a little over 30 cents,—and allows stop-overs at Sylvestre and Paineiras, where there are refreshments and hotel accommodations. At the latter station, I took an interesting walk through the woods, examining the plants at close range and making some collections. The ferns claimed my chief attention, because of their abundance, variety, and beauty. The only species seen that occur as far north as the Carolinas were the bracken (*Pteris*) and the resurrection fern (*Polypodium incanum*). I saw also one species of sphagnum moss and several beds of the hair-cap moss (*Polytrichum*) which resembled our own. On a dead stump were large masses of the tropical tree-destroying punk-fungus, *Fomes Auberianus*, first known from Cuba, where I myself have frequently collected it; while nearby on a pile of decaying trash was one of the prettiest little species of *Lepiota* I ever saw, the shapely, purplish caps growing in clusters of three or four, united by purplish cords. Needless to say, I made a good collection of these for the Garden herbarium.

The summit of the mountain is reached after a short railway journey from Paineiras and a climb of 115 feet to the observation pavilion. As I went up the steps, with one of the finest views in the whole world just ahead of me, I could not help noticing a

group of century plants that had been set out about the pavilion and were thriving remarkably well on the good soil and mountain air. I think I never saw healthier specimens, even in Mexico, their native home, and every one of the twenty or more bore a huge flower-stalk fifteen or twenty feet in height with numerous side branches. In Mexico, these stalks would have been nipped off in their early infancy and the juices so generously provided by nature for their development would have been collected and manufactured into pulque, a mildly intoxicating drink.

The Corcovado, or Hunchback, is a very peculiar mountain, being unusually thin, exceedingly precipitous, and so grotesque in shape that I singled it out long before we reached the harbor of Rio, thinking at first it must be a dark mass of clouds. The rock is solid granite, which weathers into a sticky mass of red clay held in place by the abundant vegetation and the constant supply of water that trickles over its surface. There is no frost or ice to disrupt the rock-masses—only the steady wearing away by water and the chemical alteration of the feldspar into clay, releasing the quartz and mica. The rocks which form the foundation of New York City are not granite but mostly gneisses and schists having practically the same chemical composition but of different physical structure, the mica being disposed in layers giving a banded appearance and often causing the masses to split into slabs. With the melting of our snows in the spring, a great deal of potash and other valuable mineral constituents formed during the process of weathering is washed away and becomes lost to the farmer.

As I gazed on the great and beautiful city of Rio from the summit of Corcovado, four times as high as the Woolworth Building, and looked over its wonderful harbor, encircled by mountains and guarded by rugged islands—all of the hardest granite—I thought how easy it must be to fortify it against all possible attack except from the air; for land and sea have combined to render it impregnable from any other direction.

And now farwell to Corcovado and to Rio for the present. The good ship "Van Dyck" sails for the Argentine in a few minutes.

THE FLORA OF THE TOWN OF SOUTHOLD, LONG ISLAND AND GARDINER'S ISLAND, NEW YORK

Stewart H. Burnham and Roy A. Latham

Fifth Supplementary List*

INSECT GALLS

Cecidomyia majalis O.S.—On leaves of *Quercus velutina* at Cutchogue; determined by Dr. Alfred C. Kinsey.

C. pinirigidae Pack—On needles of *Pinus rigida* at Peconic; determined by Mr. Charles T. Greene.

Cincticornia serrata Felt—On leaves of *Quercus velutina* at Cutchogue; determined by Dr. Kinsey.

Neolasioptera perfoliata Felt—On *Eupatorium perfoliatum;* determined at the Bureau of Entomology, Washington, D. C.

Oedaspis atra Loew.—On *Solidago* at Orient; determined at the Bureau of Entomology.

Parallelodiplosis Spirae Felt—On *Spirea tomentosa* at Orient and Mattituck; determined at the Bureau of Entomology.

Phyllocoptes toxicophagus Ewing—On *Rhus Toxicodendron*, var. *radicans;* determined at the Bureau of Entomology.

Rhodites globuloides Beutm.—On *Rosa carolina* at Mattituck; determined by Dr. Kinsey.

R. nebulosus Bass.—On *Rosa blanda;* determined by Dr. Kinsey.

R. radicum O. S.—On *Rosa carolina;* determined by Dr. Kinsey.

R. rosaefolii Ckll.—On *Rosa blanda;* determined by Dr. Kinsey.

EUPHYCEAE

Calothrix scopulorum (Web. & Mohr) Ag.—Banks of a salt creek at Southold; determined by Dr. M. A. Howe.

Cladophora Magdalenae Harv.—Banks of a salt creek at Southold; determined by Dr. Howe.

Draparnaldia acuta (Ag.) Kütz.—In a pool at margin of woods at Mattituck in March; determined by Dr. T. E. Hazen.

Microspora floccosa (Vauch.) Thuret—In pools in woods at Southold; determined by Dr. Hazen.

Phormidium fragile (Menegh.) Gomont—Banks of a salt creek at Southold; determined by Dr. Howe.

* The Preliminary flora was published in Torreya **14**: 201–225, Nov. 1914 and 229–254, Dec. 1914. The First Supplementary list was published in Torreya **17**: 111–122, July 1917. The Second Supplementary list was published in Torreya **21**: 1–11, Jan.-Feb. 1921 and 28–33, March-April 1921. The Third Supplementary list was published in Torreya **23**: 3–9, Jan.-Feb. 1923 and 25–31, March-April 1923. The Fourth Supplementary list was published in Torreya **24**: 22–32, March–April 1924.

Rhizoclonium tortuosum Kütz.—Salt meadows at Southold; determined by Dr. Howe.

Vaucheria geminata (Vauch.) DC., var. *racemosa* (Vauch.) Walz—Swamps at Greenport; determined by Dr. Hazen.

SCHIZOMYCETES

Bacillus carotovorus Jones,

Bacterium maculicolum McCulloch and

Pseudomonas campestris (Pammel) E. F. Smith are common on cabbage, *Brassica oleracea*, var. *capitata;* brussels sprouts, *B. oleracea*, var. *gemmifera;* and cauliflower, *B. oleracea*, var. *botrytis.*

PHYCOMYCETES

Metarrhizium Anisopliae (Metsch.) Sorokin—Orient on potato beetles; determined by Dr. Roland Thaxter. This is *Isaria Anisophilae* (Metsch.) Pettit.

Peronospora parasitica (Pers.) DeBary—On cabbage, *Brassica oleracea*, var. *capitata;* brussels sprouts, *B. oleracea*, var. *gemmifera;* and cauliflower, *B. oleracea*, var. *botrytis.*

ASCOMYCETES (EXCLUDING PYRENOMYCETES)

Ascobolus Crouani Boud. (not Cooke)—Prof. John Dearness in Mycol. **16**: 146. July 1924 says, "An *Ascobolus* was collected on stems of *Brassica oleracea gemmifera* by Roy Latham: 577, at Orient, N. Y., which is hardly separable from Boudier's *A. Crouani.* The sporidia, 15–19 × 10–11 μ, hyaline at first become so dark-brown as to obscure the reticulations which are longitudinal and anastomosing, about 6 visible on each side. 'These Brussels sprouts stems were plowed under in November and turned up the following spring; the collections were made about the end of June, 1922.'—R.L."

Phacidium Teucrii Crouan—On *Teucrium canadense*, var. *littorale* at Cutchogue; determined by Dr. Charles E. Fairman.

Rhytisma monogramma B. & C.—Mattituck on *Vitis;* determined by Prof. Dearness.

Schizoxylon Berkeleyanum (Dur. & Mont.) Fckl.—On dead stems of *Akebia quinata* at Orient, a form of this species associated with *Phoma Akebiae* Dearn.

PYRENOMYCETES

Amphisphaeria papilla (Schw.) Ell.—On bark *Nyssa sylvatica* at Greenport; determined by Prof. Dearness.

Anthostomella ostiolata Ell.—On *Benzoin aestivale* at Greenport; determined by Prof. Dearness.

Botryosphaeria graphidea (B. & Rav.) Sacc.—On *Myrica carolinensis* at Southold; determined by Prof. Dearness.

Caryospora callicarpa (Curr.) Fckl.—Orient on rose galls; determined by Dr. Fairman.

Diatrype minima E. & E.—On *Clethra alnifolia* at Greenport; determined by Prof. Dearness.

D. subferruginea B. & Rav.—Cutchogue on *Quercus Prinus;* determined by Prof. Dearness.

Diatrypella decorata Nitsch.—On *Betula populifolia* at Greenport; determined by Prof. Dearness.

D. nigro-annulata (Grev.) Nitsch.—On *Alnus incana* at Southold; determined by Prof. Dearness.

Diaporthe binoculata (Ell.) Sacc., var. *Clethrae* var. nov.—Described by Prof. Dearness in Mycol. **16**: 158. July 1924. "On dead stems of *Clethra alnifolia* L., Greenport, N. Y.; April 1923. Roy Latham: 1055."

D. gallophila Ell.—Orient on rose galls; determined by Dr. Fairman.

D. phomaspora (C. & E.) E. & E.—On *Myrica carolinensis* at Orient; determined by Dr. Fairman.

Dichaena strumosa Fr.—Laurel on *Quercus velutina;* determined by Prof. Dearness.

Dothidea Baccharidis Cke.—Prof. Dearness in Mycol. **16**: 154–155. July 1924 says, "Examination of a collection of branches of *Baccharis halimifolia* L. made by Roy Latham, Orient, N. Y., May 1923, enables me to enlarge the description of *Dothidea Baccharidis* Cke. in Grev. XI: 108 and the addendum in Ell. & Evht., N. Am. Pyr., p. 612.

The asci, p.sp., are 120 × 10–11 μ surrounded by long linear paraphyses some of them twice the length of the asci. Most but not all the sporidia are distinctly larger in the upper cell."

Eriosphaeria alligata (Fr.) Sacc.—Prof. Dearness in Mycol. **16**: 156. July 1924 says, "An *Eriosphaeria* on decaying *Sassafras* trunk; Orient, N.Y., Jan. 1923. Roy Latham: 415. This fungus grew on the rotten wood under the loosened bark. It meets in large part the requirements of the description of *Eriosphaeria alligata* in Syst. Myc. **2**: 445 and Syll. **1**: 597. It has the yellowish, bi-nucleate, constricted sporidia and the deciduous ostiolum of the flat or umbilicate perithecium. It differs in the perithecia not being distinctly collabescent and possibly in sometimes having a dense subiculum. The most conspicuous feature in this collection is the red, rough, flat surface of the perithecia with the brown hyphal appendages, 200 × 4–5 μ. Asci 75–90 μ; paraphyses numerous, branching, longer than the asci. Sporidia 1-septate; monostichous or in some of the asci subbiseriate, 15–21 × 4.5–6 μ.

Another collection, at Orient, Feb., 1924, was under the loosened bark of *Sambucus* sp."

Erysiphe Galeopsidis DC.—Mattituck on *Scutellaria galericulata;* determined by Prof. Dearness.

E. Polygoni DC.—On cabbage, *Brassica oleracea*, var. *capitata* at Orient; determined by Prof. Dearness.

Eutypella capillata E. & E.—Greenport on *Vitis;* determined by Prof. Dearness.

E. glandulosa (Cke.) E. & E.—Prof. Dearness in Mycol. **16**: 158. July 1924 says, "Near Orient, N. Y., Roy Latham has collected *Eutypellae* on *Ailanthus*, *Akebia*, *Amelanchier*, *Robinia*, *Sassafras*, *Quercus*, and *Vitis* which can hardly be separated except by their hosts. And while they are referred to *Eutypella glandulosa* Cke., this species is separated by rather obscure differences of essential characters from *Eu. deusta* E. & E., *Eu. capillata* E. & E., and *Eu. microcarpa* E. & E. Their sporidia range somewhat under $4 \times 1 \mu$; their asci, perithecia and stromata are similar; and their perithecia impress the wood."

E. Platani (Schw.) Sacc.—On *Platanus occidentalis* at Mattituck; determined by Mr. W. W. Diehl.

E. stellulata (Fr.) Sacc.—The form described under *Eutypella tetraploa* (B. & C.) Sacc., on *Maclura pomifera* at Orient; determined by Prof. Dearness.

Herpotrichia Rhenana Fckl.—Greenport on *Sambucus canadensis;* determined by Dr. Fairman.

Hypoderma commune (Fr.) Duby—Orient on *Paeonia;* determined by Dr. Fairman.

Hypoxylon Ravenelii Rehm—On *Robinia Pseudo-Acacia* at Orient; determined by Prof. Dearness.

Leptosphaeria dumetorum Niessl.—Orient on *Baccharis halimifolia;* determined by Prof. Dearness.

Lophiostoma pulveraceum Sacc.—Involucral bracts of beechnuts, *Fagus grandifolia* at Cutchogue; determined by Dr. Fairman.

Lophodermium pinastri (Schrad.) Chev.—Peconic on *Pinus rigida;* determined by Prof. Dearness.

Melanconis stilbostoma (Fr.) Tul.—Orient on *Betula populifolia;* determined by Prof. Dearness.

Melanomma pulvis-pyrius (Pers.) Fckl.—On *Clethra alnifolia* at Greenport; determined by Dr. Fairman.

Mycosphaerella indistincta (Pk.) Lindau—Mattituck on *Thelypteris palustris;* determined by Prof. Dearness. (*Sphaerella indistincta* Pk.).

M. spleniata (Cke. & Pk.) House—Peconic on *Quercus alba;* determined by Prof. Dearness.

Phyllachora vulgata Theiss. & Syd.—Mattituck on *Muhlenbergia sylvatica;* determined by Prof. Dearness, who says, "a fine thing."

Physalospora erratica (C. & E.) Sacc.—Prof. Dearness in Mycol. **16**: 157. July 1924 says, "On dead apple branches, Orient, N. Y., Roy Latham: 969. If the identification of this collection is right the description in E. & E. N. Am. Pyr., p. 306, may be completed as follows: Perithecia 340μ, depressed-globose, merely perforating the epidermis and coming off with it. Asci clavate, $150–200 \times 15–20 \mu$."

P. rhodina B. & C.—Greenport on *Crataegus;* determined by Prof. Dearness.

Pyrenophora calvescens (Fr.) Sacc.—Orient on *Chenopodium album;* determined by Prof. Dearness.

Rhopographus clavisporus (C. & P.) E. & E.—On stalks of *Zea Mays* at Mattituck; determined by Prof. Dearness.

Rosellinia ligniaria (Grev.) Sacc.—Prof. Dearness in Mycol. **16**: 156. July 1924 says, "On bare blackened wood, a *Rosellinia* agreeing well with *ligniaria* except that the asci are only 45–60 μ instead of the usual 75–80 μ of the type. Sporidia $10 \times 7 \mu$. Perithecial bristles 15 to 40 mostly $20 \times 4 \mu$. Collected at Greenport, N. Y. Roy Latham: 551."

Sphaerotheca Humuli (DC.) Burr., var. *fuliginea* (Schlect) Salmon—Mattituck on *Bidens;* determined by Prof. Dearness, who says, "usually listed as *Sphaerotheca Castagnei* Lev."

Valsa cenisia DeNot.—Orient on *Juniperus virginiana;* determined by Prof. Dearness.

V. clausa C. & E.—Greenport on *Crataegus;* determined by Prof. Dearness.

V. querna Curr.—Orient on *Myrica carolinensis;* determined by Prof. Dearness.

V. Toxici (Schw.) E. & E.—On *Rhus Toxicodendron*, var. *radicans* at Orient; determined by Prof. Dearness.

HYPOMYCETES

Botrytis Rileyi Farl.—Prof. Dearness in Mycol. **16**: 173. July 1924 says, "Rept. U. S. Commissioner of Agriculture, 1883, p. 121. On the clover looper—*Plathypena scabra*—Orient, N. Y., Sept., 1922. Roy Latham: 572. Determination confirmed by Dr. Roland Thaxter. 'This fungus killed thousands of larvae on beans this season (1922).'—R. L."

Cercospora Boehmeriae Pk.—On *Boehmeria cylindrica* at Mattituck; determined by Prof. Dearness.

C. depazeoides (Desm.) Sacc.—Mattituck on *Sambucus canadensis;* determined by Prof. Dearness.

C. Nesaeae E. & E.—Mattituck on *Decodon verticillatus;* determined by Prof. Dearness.

C. tuberosa Ell. & Kell.—On *Apios tuberosa* at Mattituck; determined by Prof. Dearness.

Cladosporium graminum Cda.—On grasses at Southold; determined by Prof. Dearness.

Macrosporium asclepiadeum Cke.—On *Asclepias* at Mattituck; determined by Dr. Fairman.

Ramularia Brunellae E. & E.—On *Prunella vulgaris* at Orient; determined by Prof. Dearness.

R. Epilobii Alesch.—On *Epilobium* at Mattituck; determined by Prof. Dearness.

Sporotrichum agaricinum Link—On *Lactarius* at Greenport; determined by Prof. Dearness.

Trichosporium olivatrum Sacc.—Orient on *Juniperus virginiana;* determined by Prof. Dearness.

Trimmatostroma Salicis Cda.—Mattituck on *Salix;* determined by Prof. Dearness.

MELANCONIALES

Colletotrichum Lindemuthianum (Sacc. & Magn.) Scribn.—On lima bean, *Phaseolus limensis.* (*Gloeosporium Lindemuthianum* Sacc. & Magn.)

C. lagenarium (Pass.) Ell. & Hals.—On cucumber, *Cucumis sativus* at Orient; determined by Prof. Dearness.

Gloeosporium Lathami sp. nov.—Described by Prof. Dearness in Mycol. **16**: 168. July 1924. "On living leaves of *Quercus stellata* Wang. Orient, N. Y.; Sept., 1917. Roy Latham: 829. 'Conspicuous in the fall; one tree in the center of a wood was covered with it.'—R. L."

G. Sanguisorbae Fckl.—Mattituck on *Sanguisorba canadensis;* determined by Dr. Fairman.

Myxosporium Oenotherae sp. nov.—Described by Prof. Dearness in Mycol. **16**: 169. July 1924. "On dead capsules of *Oenothera biennis* L. Orient, N. Y.; Dec., 1922. Roy Latham: 514."

Pestalozzia scirpina Ell. & Mart.—On *Dulichium arundinaceum* at Orient; determined by Prof. Dearness, who says it agrees with the measurement of this species, which was first collected by Dr. J. T. Rothrock, on *Scirpus maritimus,* in Maryland in July 1884. It is described in Am. Nat. **19**: 76. Jan. 1885: and is No. 2181 of Ellis & Everhart's N. Am. Fungi, 1888–1889.

P. Syringae Oud.—Orient on *Diervilla* (*Weigela*); determined by Prof. Dearness.

Septogloeum Celtidis sp. nov.—Described by Prof. Dearness in Mycol. **16**: 170. July 1924. "On leaves of *Celtis occidentalis* L. Orient, N. Y.; Oct., 1919. Roy Latham: 83."

SPHAEROPSIDEAE

Botryodiplodia compressa (Cke.) Sacc., *f. Toxicodendri*—Prof. Dearness in Mycol. **16**: 163. July 1924 describes this as a new form. "On *Rhus Toxicodendron* L. Orient, N. Y., March, 1923. Roy Latham: 962."

Dichromera Clethrae sp. nov.—Described by Prof. Dearness in Mycol. **16**: 164. July 1924. "On dead stems of *Clethra alnifolia* L. Greenport, N. Y., April, 1923. Roy Latham: 1044b. Externally like *Steganosporium fenestratum* (E. & E.) Sacc. on the same host."

Diplodina epicarya Fairm.—On pit of prune, *Prunus domestica* at Orient; determined by Prof. Dearness.

Discosia minima B. & C.—On nuts of *Carya glabra* at Mattituck; determined by Dr. Fairman.

Dothiorella Celtidis Pk.—Mattituck on *Celtis occidentalis;* determined by Dr. Fairman.

Leptothyrella Lathami sp. nov.—Described by Prof. Dearness in Mycol. **16**: 166. July, 1924. "On decorticated *Robinia Pseudo-Acacia* L. Orient, N. Y.; Feb., 1923. Roy Latham: 986."

Leptothyrium Smilacis sp. nov.—Described by Prof. Dearness in Mycol. **16**: 165–166. July 1924. "On twigs and branchlets of *Smilax rotundifolia* L. Orient, N. Y.; Feb., 1920. Roy Latham: 1339."

Macrophoma Oenotherae-biennis sp. nov.—Described by Prof. Dearness in Mycol. **16**: 160. July 1924. "On dead capsules and stems of the inflorescence of *Oenothera biennis* L.; Orient, N. Y.; Dec., 1922. Roy Latham: 514."

Phoma acicola (Lev.) Sacc.—Peconic on needles of *Pinus rigida;* determined by Dr. Fairman.

P. acuum C. & E.—Southold on needles of *Pinus rigida;* determined by both Dr. Fairman and Prof. Dearness.

P. Akebiae sp. nov.—Described by Prof. Dearness in Mycol. **16**: 159–160. July 1924. "On dead stems of *Akebia quinata* Decaisne, associated with a form of *Schizoxylon Berkeleyanum;* Orient, N. Y.; May, 1923. R. Latham: 1124."

Phoma celtidicola Brun.—Mattituck on *Celtis occidentalis;* determined by Dr. Fairman.

P. Dulcamarina Sacc.—Greenport on *Solanum Dulcamara;* determined by Prof. Dearness.

P. enteroleuca Sacc.—On *Syringa vulgaris* at Orient; determined by Prof. Dearness.

P. lingam (Tode) Desm.—Common on brussels sprouts, *Brassica oleracea,* var. *gemmifera.*

P. lirellata Sacc.—Orient on *Paeonia;* determined by Dr. Fairman.

P. spermoides sp. nov.—Described by Prof. Dearness in Mycol. **16**: 160. July 1924. "On dead stems of *Thalictrum* sp.; Orient, N. Y.; March, 1923. Roy Latham: 1130. *P. thalactrina* Sacc. has much larger spores."

P. strobiligena Desm.—On cones of *Pinus rigida;* determined by both Prof. Dearness and Dr. Fairman.

Phyllosticta Clethricola Ell. & Mart.—Greenport on *Clethra alnifolia;* determined by Prof. Dearness.

P. cruenta (Fr.) Kickx., var. *longispora* var. nov.—Described by Prof. Dearness in Mycol. **16**: 159. July 1924. "On *Polygonatum biflorum* (Walt.) Ell. Orient, N. Y., Aug. 1923. R. Latham: 1342."

P. Hamamelidis (Cke.) Mart.—Greenport on *Hamamelis virginiana;* determined by Dr. Fairman.

Septoria ampelina B. & C.—On *Vitis* at Mattituck; determined by Prof. Dearness.

S. noctiflorae Ell. & Kell.—On *Lychnis alba* at Mattituck; determined by Prof. Dearness.

S. Radiculae sp. nov.—Described by Prof. Dearness in Mycol. **16**: 165. July 1924. "On living leaves of *Radicula palustris* (L.) Moench. Southold, N. Y.; Sept., 1922. Roy Latham: 685."

Sphaeropsis Akebiae sp. nov.—Described by Prof. Dearness in Mycol. **16:** 161. July 1924. "On dead stems of *Akebia quinata* Decaisne. June, 1923; Long Island, N. Y. R. Latham." Collected at Orient.

S. Amelanchieris sp. nov.—Described by Prof. Dearness in Mycol. **16:** 161. July 1924. "On dead branches of *Amelanchier canadensis* (L.) Medic. Orient, N. Y., Dec., 1923. Roy Latham: 532. The conidia are longer and narrower than those of other Sphaeropses on pomaceous hosts with which they were compared." This species was also collected at Greenport.

S. Celtidis E. & E.—On *Celtis occidentalis* at Mattituck; determined by Dr. Fairman.

S. insignis B. & C.—On acorns of *Quercus alba* at Laurel; determined by Dr. Fairman.

S. latispora (Pk.) Dearn.—On *Smilax rotundifolia* at Orient; determined by Prof. Dearness.

S. Platani Pk.—Mattituck on *Platanus occidentalis;* determined by Prof. Dearness.

S. punctum C. & E.—Orient on *Diervilla* (*Weigela*); determined by Prof. Dearness.

S. Sambuci Pk.—On *Sambucus canadensis* at Mattituck; determined by Prof. Dearness.

S. Tecomae sp. nov.—Described by Prof. Dearness in Mycol. **16:** 162. July 1924. "On dead branches of *Tecoma radicans* (L.) Juss. Orient, N. Y., Jan., 1923. R. Latham: 672, 1185."

Vermicularia Polygonati Schw.—Orient on *Smilacina stellata;* determined by Prof. Dearness.

USTILAGINACEAE

Cintractia Montagnei (Tul.) Magn.—Orient on *Rynchospora glomerata;* determined by Dr. H. S. Jackson.

Urocystis Anemones (Pers.) Wint.—On *Anemone quinquefolia* at Orient; determined by Dr. Jackson.

PUCCINIACEAE

Gymnosporangium Botryapites (Schw.) Kern—On *Chamaecyparis thyoides* at Laurel; determined by Prof. Dearness.

Puccinia hieraciata (Schw.) Jackson.—On *Carex* at Greenport; determined by Dr. Jackson.

Uromyces Eleocharidis Arth.—On *Eleocharis obtusa* at Orient; determined by Dr. Jackson.

U. Rynchosporae (Ellis) Arth.—Orient on *Rynchospora glomerata;* determined by Dr. Jackson.

U. verruculosus Schroet.—Greenport on *Lychnis alba;* determined by Dr. Jackson, who says, "very rare, has only previously been reported from Michigan, and is presumably an introduced rust, as it is common in Europe."

THELEPHORACEAE

Cyphella fasciculata (Schw.) B. & C.—Peconic on *Alnus;* determined by Dr. E. A. Burt.

HYDNACEAE

Grandinia tuberculata B. & C.—On *Acer* at Greenport; determined by Prof. Dearness.

POLYPORACEAE

Boletinus decipiens (B. & C.) Pk.—Sandy woods at Southold; determined by Prof. Dearness. (*Boletinus Berkeleyi* Murrill.)

Boletus luteus L.—Low sandy woods at Southold; determined by Prof. Dearness.

AGARICACEAE

Collybia acervata Fr.—Low woods at Southold; determined by Prof. Dearness.

Pleurotus applicatus (Batsch) Fr.—Old trunks of *Pinus* at Cutchogue; determined by Prof. Dearness.

P. spathulatus (Fr.) Pk.—Earth in rich woods at Greenport; determined by Dr. C. G. Lloyd, and reported in Mycol. Notes, No. **72:** 1296 June 1924.

STERILE MYCELIUM

Rhizomorpha subcorticalis Pers.—Greenport on *Liriodendron Tulipifera;* determined by Prof. Dearness.

LICHENES*

Alectoria chalybeiformis (L.) S. F. Gray—Orient.

Biatorella clavus (Lam. & DC.) Th. Fr.—On rocks at Orient.

Bilimbia sphaeroides (Dicks.) Koerb.—On bark of *Acer rubrum* at Greenport.

Cladonia crispata (Ach.) Flot., var. *elegans* (Del.) Wainio.—Sandy soil at Orient.

C. pityrea (Flk.) Fr.—Sandy soil at Orient.

C. uncialis (L.) Weber, f. *humilis* Mass.—Sandy soil at Orient.

C. verticillata (Hoffm.) Flk., var. *evoluta* Th. Fr.—Rotten wood in swamps at Laurel.

Nephromopsis ciliaris (Ach.) Hue—Trees at Greenport. (*Cetraria ciliaris* Ach.)

Parmelia cetrata Ach.—Bark of *Juniperus virginiana* at Orient.

P. verrucilifera Nyl.—Bark of *Quercus* at Orient; and on *Acer* at Greenport.

Physcia setosa (Ach.) Nyl.—On *Acer* at Greenport.

Polyblastiopsis fallax (Nyl.)—Orient on *Myrica carolinensis;* determined by Dr. Bruce Fink, through Dr. Thaxter.

Rhizocarpon confervoides DC.—On rock at Orient. (*Rhizocarpon petraea* (Wulf.) Tuck. in part.

* Unless otherwise stated the Lichens were determined by Dr. C. C. Plitt and are deposited in the Herbarium of the Sullivant Moss Society.

HEPATICAE*

Bazzania trilobata (L.) S. F. Gray—Swamps at Laurel.
Cephalozia bicuspidata (L.) Dum.—Swamps at Laurel.
C. catenulata (Hüben) Spruce—Bank in a swamp at Southold.
Jamesoniella autumnalis (DC.) Steph.—Laurel.
Lepidozia sylvatica Evans—Old logs in a swamp at Greenport.
Odontoschisma denudatum (Mert.) Dumort.—Bank in a swamp at Greenport.
Riccardia latifrons Lindb.—Banks in a swamp at Southold.
R. multifida (L.) S. F. Gray—Decayed wood at Southold.

MUSCI†

Aulacomnium heterostichum (Hedw.) B. & S.—Base of trees in a swamp at Laurel.
Brachythecium salebrosum (Hoffm.) B. & S.—Swamps at Mattituck.
Bryum argenteum L.—Orient on bare soil in lawns.
Calliergon cuspidatum (L.) Kindb.—Swamp at Laurel.
C. Schreberi (Willd.) Grout—Swamp at Laurel.
Fontinalis Novae-Angliae Sull.—Swamp at Greenport.
Mnium punctatum L.—Swamp at Laurel.
M. punctatum, var. *elatum* Schimp.—Swamp at Laurel.
Orthotrichum pusillum Mitt.—Bark at *Quercus* at Mattituck.
O. sordidum Sull. & Lesq.—Laurel on *Quercus*.
Thuidium microphyllum (Sw.) Best—Low woods at Mattituck.

SPERMATOPHYTA*

* Records of plants collected on Shelter Island, Plum Island and Fisher's Island are included in this list.

Chamaecyparis thyoides (L.) B.S.P.—Swamp at Laurel, the host of *Gymnosporangium Botryapites*.
Najas gracillima (A. Br.) Magnus—Sandy pond at Southold; determined at the Bureau of Plant Industry, Washington.
Potamogeton heterophyllus Schreb.—Sandy pond at Southold; determined at the Bureau of Plant Industry.
P. natans L.—Swamp at Greenport; determined by Mr. Norman Taylor.
P. pulcher Tuck.—Swamp at Greenport; determined by Mr. Wm. C. Ferguson.
Elodea Nuttallii (Planch.) St. John—In a pond at Greenport; determined at the N. Y. Botanical Garden.
Distichlis spicata (L.) Greene—Salt marshes, Shelter Island; collected by Dr. H. D. House, No. 9703 of August 15, 1923.
Paspalum psammophilum Nash—"Fisher's Island, Taylor (Fl. Vic. N. Y. 100. 1915)." N. Y. State Mus. Bull. **254:** 70. 1924.

* The Hepatics were determined by Dr. G. H. Conklin and are deposited in the Herbarium of the Sullivant Moss Society.

† The mosses were determined by Mr. Geo. B. Kaiser and are deposited in the Herbarium of the Sullivant Moss Society.

Spartina patens (Ait.) Muhl., var. *juncea* (Mx.) Hitchc.—Salt marshes, Shelter Island; collected by Dr. House, No. 9702.

Carex anceps Muhl.—Not rare in dry woods at Laurel; determined by Mr. Ferguson. (*Carex laxiflora* Lam., var. *patulifolia* (Dewey) Carey.)

C. annectens Bicknell—Wet woods, Greenport; determined by Mr. Ferguson.

C. convoluta Mackenz.—Wet woods at Laurel; determined by Mr. Ferguson. (*Carex rosea* Schkr., var. *pusilla* Pk.)

C. echinata Murr., var. *cephalantha* Bailey—Swamp at Cutchogue; determined by Mr. Ferguson. (*Carex cephalantha* (Bailey) Bickn.)

C. Grayii Carey—Rich woods at Greenport; determined by Mr. G. P. Van Eseltine.

C. Longii Mackenz.—Rich ground at Greenport; determined by Mr. Ferguson. (*Carex albolutescens* Schwein.)

C. normalis Mackenz.—Rich woods at Greenport; determined by Mr. Van-Eseltine. (*Carex mirabilis* Dewey.)

C. striata Mx., var. *brevis* Bailey—Bog at Laurel; determined by Mr. Ferguson. (*Carex Walteriana* Bailey).

C. tribuloides Wahl.—Low woods at Greenport; determined by Mr. Ferguson.

Eleocharis palustris (L.) R. & S., var. *glaucescens* (Willd.) Gray—Greenport; determined by Mr. Ferguson.

E. rostellata Torr.—Salt marshes, Cutchogue and Peconic; determined by Mr. Ferguson.

Scirpus nanus Spreng.—Mud on salt marshes at Bay View, Greenport and Orient; determined by Mr. Ferguson.

Orontium aquaticum L.—A few plants in a swamp near Laurel.

Juncus canadensis J. Gay—Margin of salt marsh, Shelter Island; collected by Dr. House, No. 9681.

J. dichotomus Ell.—Dr. Charles B. Graves in Bull. Torr. Bot. Club **23**: 59. Feb. 1896 says, "In August, 1892, the writer discovered *Juncus dichotomus* growing upon Plum Island, and during the past summer found it to be not rare upon Fisher's Island."

Pogonia verticillata (Willd.) Nutt.—Miss Margaret A. Fay found several hundred plants in moist woods at Southold. Mrs. William Fay collected it in rich woods at Greenport.

Polygonum aviculare L., var. *angustissimum* Meisn.—Waste ground, Orient.; determined by Mr. Ferguson. (*Polygonum neglectum* Besser.)

Atriplex arenaria Nutt.—Sandy and gravelly shores, Shelter Island; collected by Dr. House, No. 9690a.

Suaeda linearis (Ell.) Moq.—Salt marshes, Shelter Island; collected by Dr. House, No. 9691.

Spergularia salina J. & C. Presl.—Salt marshes, Shelter Island; collected by Dr. House, No. 9694. (*Tissa marina* (L.) Britton.)

Brasenia Schreberi Gmel.—Rare in a pond at Laurel.

Ranunculus micranthus Nutt.—Wet sands, Fisher's Island; determined at N.Y. Botanical Garden.

Diplotaxis tenuifolia (L.) DC.—Waste place at Orient.

Thlaspi arvense L.—Cultivated ground at Orient.

Rubus odoratus L.—Rare in rich woods at Greenport.

Cassia Chamaecrista L.—Dry fields, Shelter Island; collected by Dr. House, No. 9680.

Lathyrus maritimus (L.) Bigel.—Sandy soil near the shore, Shelter Island; collected by Dr. House, No. 9683.

Lespedeza capitata Mx., var. *velutina* (Bicknell) Fernald—Upper border of salt marshes at Orient; determined by Mr. Ferguson. (*Lespedeza Bicknellii* House.)

Strophostyles umbellata (Muhl.) Britton—Salt marshes at Bay View and Greenport.

Trifolium arvense L.—Dry fields, Shelter Island; collected by Dr. House, No. 9676.

Euphorbia glyptosperma Engelm.—Dr. Graves, in Bull. Torr. Bot. Club **23:** 59. Feb. 1896 says in 1895, he found near the east end of Fisher's Island "a small colony of *Euphorbia glyptosperma* Engelm. far out of its cited range."

Callitriche deflexa A. Br., var. *Austini* (Engelm.) Hegelm.—Thin bare soil mostly along wagon roads, rather common at Southold. Rare on dryer soil in woods at Greenport; determined at N. Y. Botanical Garden.

Rhus copallina L.—Dry banks, Shelter Island; collected by Dr. House, No. 9697.

R. typhina L.—Rare on hills at Mattituck.

Helianthemum Bicknellii Fernald—Mattituck; determined at the Bureau of Plant Industry.

Viola sagittata Ait.—Moist sandy soil at Southold; determined by Mr. Ferguson.

Oenothera laciniata Hill—Local in dry soil, Laurel.

Myriophyllum humile (Raf.) Morong—Fisher's Island, Sept. 15, 1891: collected by Rev. J. L. Zabriskie. (*Myriophyllum ambiguum* Nutt., var. *limosum* Nutt.)

Aralia hispida Vent.—Sandy soil, rare at Southold; determined by Mr. Ferguson.

Ligusticum scoticum L.—Dr. Graves in Bull. Torr. Bot. Club **23:** 59. Feb. 1896 says, "*Ligusticum scoticum* L. has been known for some years to be frequent upon Fisher's Island; in August, 1895, a station for it was found on the north shore of Plum Island."

Zizia aurea (L.) Koch—Fisher's Island; determined by Mr. Ferguson.

Z. cordata (Walt.) DC.—Rare on Fisher's Island; determined by Mr. Ferguson.

Limonium trichogonum Blake—Salt marshes, Shelter Island; collected by Dr. House, No. 9668.

Fraxinus pennsylvanica Marsh.—"Greenport, swampy woods." Mr. Ferguson in Bull. Torr. Bot. Club **51:** 195. May 1924.

Bartonia paniculata (Mx.) Robins.—Sandy swamp, Southold, September 30, 1923. Plants very slender, leaf-scales and branches alternate, corolla lobes sharp pointed. Growing with *Bartonia virginica* (L.) BSP.

Asclepias rubra L.—Dry hills, East Marion, rare; determined by Dr. John K. Small.

Cuscuta polygonorum Engelm.—Sandy swamp at Mattituck; determined at the Bureau of Plant Industry as *Cuscuta obtusiflora* HBK.

Lamium maculatum L.—Fields at Cutchogue; collected by Mrs. Fay.

Marrubium vulgare L.—Dry waste places, Laurel; determined by Dr. Small.

Mentha longifolia (L.) Huds.—Roadsides, Southold; collected by Mrs. Fay.

Thymus Serpyllum L.—Dry hills, Fisher's Island; determined by Dr. Small.

Ilysanthes inaequalis (Walt.) Pennell—Sandy shore of a pond at Laurel; determined by Mr. Ferguson. (*Ilysanthes anagallidea* (Mx.) Robins.)

Plantago decipiens Barneoud—Salt marshes, Shelter Island; collected by Dr. House, No. 9692.

P. elongata Pursh—Dr. Graves in Bull. Torr. Bot. Club **23**: 59. Feb. 1896 says, "In 1892 *Plantago elongata* Pursh (*P. pusilla* Nutt.) was detected growing on the south side of Fisher's Island."

Jasione montana L.—All around the borders of one field, at Laurel, covering an acre; and evidently is spreading.

Aster concolor L.—Sandy ground at Bay View.

A. ericoides L., var. *villosus* T. & G.—Dry woods, Laurel; determined by Mr. Ferguson.

A. nemoralis Ait.—Sandy swamp at Laurel, rare; determined by Mr. Ferguson.

A. paniculatus Lam.—Salt marshes, Shelter Island; collected by Dr. House, No. 9686.

Centaurea vochinensis Bernh.—Greenport and Bay View; collected by Mrs. Fay and determined by Mr. Ferguson.

Solidago Michauxii House—"Cutchogue, Latham" (*Solidago minor* (Mx.) Fernald).

S. serotina Ait., var. *gigantea* (Ait.) Gray—Sandy swamp, Mattituck; determined by Mr. ——————.

BOOK REVIEWS

Bibliography of American Natural History*

This volume is the first of three which, when completed, will constitute the most important contribution ever made to the history of natural science in the United States. The entire work is strictly bibliographic, and consequently intended solely as a work of reference, but it supplies the key needed to unlock

* Meisel, Max. A bibliography of American natural history: the pioneer century, 1769–1865. Volume I. An annotated bibliography of . . . the history, biography and bibliography . . . published up to 1924; . . . and a bibliography of biographies. 244 pages. Premier Publishing Co., 626 [now 658] Broadway, Brooklyn, N. Y., [November 1924.] Price (cloth), $5.00, postpaid.

the stores of historical material relating to the early years of American biologic and geologic science. It deals only with the period termed by the author the "pioneer century," from the formation of the American Philosophical Society in 1769 to the close of the Civil War in 1865. This period is of course the most important one for treatment in this way, and the present publication supplies a solid foundation upon which to build similar work relating to the progress of American natural history in later years.

The importance of this undertaking can perhaps not be stated any more clearly than by these words from the preface defining its scope: "During this century the pioneers . . . laid the foundations for the great achievements in American natural history with which we are so familiar today. . . . The Bibliography aims to record the natural history contents of the publications of nearly ninety societies; of twenty-five journals; of thirty-six state geological and natural history surveys; of fifteen natural history museums and botanic gardens; and of over seventy federal exploring expeditions and surveys."

Mr. Meisel, who has been engaged in this undertaking for nearly ten years, has done his work thoroughly and presented his results clearly. The preface to this first volume outlines the scope of all three, and the table of contents includes the second and third volumes. The author assures me that there is reasonable hope that the two remaining volumes will appear with no serious delay. Their appearance, however, is in part contingent upon the sale of the first volume, and libraries that need a work of this kind should lose no time in securing this volume, thus encouraging the publication of the remainder.

The present volume is wholly historical and biographical. Seventy-three pages are devoted to an annotated list of the publications relating to the history, biography, and bibliography of early American natural history and its institutions which have been published up to 1924; thirty-seven pages to a subject index and fifteen pages to a geographic index to the annotated list; and eighty-nine pages to a selected list of biographies and bibliographies of the principal early American naturalists.

It is needless to say that it is impossible, in a work of this character, to avoid occasional clerical or typographical errors, but in the present instance these are remarkably few. It could

accomplish no good result to enumerate here the imperfections that have come to the notice of the reviewer. And omissions seems to be as scarce as errors.

JOHN HENDLEY BARNHART.

WINTER BOTANY, WILLIAM TRELEASE*

This little book is a companion volume to the author's Plant Materials of Decorative Gardening which gives keys for determining trees and shrubs in their summer condition. The present volume gives keys based on twig, bud and leaf-scar characters by means of which practically all of the trees and shrubs, native or cultivated, can be determined in the winter. The key refers to 328 genera and 1100 species and varieties, considerably more than are given in Plant Materials, though the evergreens described in that volume are omitted in the present book. With all genera containing more than one species keys are given to the species or varieties.

Necessarily the characters used to separate species are often comparative and so difficult to use where only one form is being traced out. For example it will be difficult to decide whether a twig is "distinctly glandular-warty" or "nearly smooth," or again whether a twig is "moderately slender" or "very slender." In such cases it may be impossible to decide which species one has, but nine times out of ten there should be no trouble. With each genus is a series of drawings showing clearly the determining characters, with the aid of these drawings the user may feel certain of his identification of the genus and often of the species. The characters of the genera are described briefly, but no descriptions of the species are given. This omission is necessary in a book of pocket size that attempts to give so many species.

After each genus, or sometimes after the last genus of a family, page references for each species are given to a number of texts. In some cases these references occupy as much as two pages. As the books referred to are listed in the back these references to species might have been omitted with considerable saving of space. For example, page references are given for every species of

* WILLIAM TRELEASE, Winter Botany. Second Edition, Revised, Published by the author, Urbana, Ill. Pages xlii + 396. 1925.

native tree to Blakeslee and Jarvis, New England Trees in Winter, similarly for nearly every cultivated shrub or tree given references are made to the pages in Schneider's Dendrolische Winterstudien. The names used are those given in Bailey's Cyclopedia of Horticulture. For many of the species one, and only one, common name is given, other species have only the scientific name. A freer use of common names and synonyms for frequently used scientific names would have added to the value of the book.

The book will fit the coat pocket comfortably. The dark brown cover offers little contrast to the black lettering on it, otherwise no fault can be found with the appearance of the book as it is well printed on good paper and bound in flexible cloth. Within the limits of so small a book it is surprising how much has been included. The book will prove almost invaluable to those who wish to determine trees and shrubs in winter.

George T. Hastings.

PROCEEDINGS OF THE CLUB

Meeting of March 10, 1925

This meeting was held at the American Museum of Natural History at 8:15 p.m., with Vice President Richards in the chair. The attendance was 22.

Dr. George H. Shull, of Princeton University, gave a lecture on "Genetical Studies in Oenothera."

The lecturer remarked the extensive work which has been done on the genetics of Oenothera by de Vries, who is still vigorously engaged at the work which he began 40 years ago, and by numerous investigators who have joined him in recent years, the lecturer's own work having been continued now for a period of 20 years. Examples were given to illustrate the two most fundamental peculiarities of Oenothera genetics, the production of unlike reciprocal hybrids and the splitting in F_1 to form the so-called "twin" hybrids.

Diagrams were displayed representing the manner in which two sets of balanced lethal factors account for the fundamental peculiarities of genetical behavior in the Oenotheras, the *Lamarckiana* type being characterized by a double pair of zygote lethals which account for the F_1 splitting, the *biennis* type by a

pair of sperm lethals, balanced by a pair of egg lethals, which account for the unlikeness of reciprocal hybrids. In both types the result is the maintenance of true-breeding species, all the individuals of which are uniformly heterozygous. The demonstration of the existence of these lethal factors has been possible because of the linkage between the lethals and other factors which give rise to visible characters, and the occurrence of crossing over which has separated and recombined the lethals in new combinations with the other known factors.

Including these balanced lethals, 13 factors are recognized as belonging to a single linkage group.

Two factors have now been found which are independent of the large linkage group; one of these is the short-styled *brevistylis* discovered by de Vries, in nature, at the beginning of his work 40 years ago, but not yet discovered in experimental culture except as recessive segregates from previous crosses. The second is the "old gold" factor which is not only independent of the big linkage group, but also independent of *brevistylis*, giving in crosses with the latter, the typical dihybrid Mendelian ratio, 9 : 3 : 3 : 1, regardless of the presence or absence of the lethals or of other factors belonging to the big linkage group.

Slides were shown illustrating the new double-flowered mutant form, mut. *supplena*, which originated last summer in the lecturer's cultures, being the first double-flowered Oenothera which has been reported. This mutation was repeated eight times in one culture and was associated with three different vegetative habits which were recognized as being differentiated from one another in the number of lethal factors present. This is taken to indicate the probable independence, or near independence, of the *supplena* factor from the big linkage group, but this conclusion is tentative and awaits critical evidence from the coming summer's cultures.

Arthur H. Graves, *Secretary.*

NEWS NOTES

The Bulletin of the Torrey Botanical Club which has formerly been issued in twelve numbers a year has been changed to nine numbers, none being published during July, August and September. There will be no decrease in the total pagination for the year.

Professor Tracy E. Hazen, editor of the Bulletin, sailed for London on May 30, expecting to spend most of the summer in England and Norway continuing his studies on unicellular algae.

Dr. Karl Wiegand of Cornell University is spending the summer in Newfoundland with Dr. Farnald, collecting and studying the vegetation. He will not return till late in September.

Dr. John K. Small returned to the New York Botanical Garden the last of May from his trip across the Gulf States. With Dr. Edgar T. Wherry of the U. S. Department of Agriculture, he travelled seven thousand miles by motor truck. Starting from Cape Sable at the southern tip of Florida the party went up the east coast, across northern Florida and along the Gulf Coast of Alabama, Mississippi, Louisiana and Texas to the Rio Grande at Brownsville. The party ascended the Rio Grande to El Paso, then turned east, returning through the northern parts of the same states already passed through and down the west coast of Florida to the starting point. Several thousand specimens were collected and many pictures taken of plants and plant-associations.

This summer prizes are being offered in a large number of boys' and girls' camps for the best collections of wild flowers. The prizes are known as the Samuel Fessenden Clark prizes, named for Dr. Clark, Professor Emeritus of Natural History at Williams College. The purpose of the prizes is to "inspire young people with a love of the open and an appreciation of the beautiful in nature, to increase their powers of observation and to establish lasting friendships among the flowers that may become a source of pleasure, increasing with the years.

Errata

In the last issue of Torreya, No. 3 of Vol. 25, on page 58, the numbers on illustrations 6 and 7 should be interchanged.

The Torrey Botanical Club

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BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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TORREYA

Vol. 25 No. 5

September-October, 1925

HOLLY AND LAUREL

For a long time it has been evident to those of us who live in large cities that unless something was done to save the American Holly, there would soon be none left to be saved. Many of us stopped buying Holly, at least ten years ago, and have used artificial or natural substitutes. Excellent imitations of Poinsettia and Holly may be had, and these do not shrivel and grow shabby so soon, and may be used again and again in different combinations. Many of the large shops use artificial wreaths because they keep better than the natural ones, look handsomer, and may be used again another year. Garlands of laurel are not used as much as formerly because the use of ropes of laurel and ground pine has been so cheapened and abused that people of good taste no longer take pleasure in this form of decoration. But that there is entirely too much laurel roping still used cannot be denied. However, we may take comfort and consolation in the fact that, though there is no good substitute for the laurel, we are told by the State foresters of Connecticut that it may be grown with profit as a crop, and that on many rocky and waste pastures in that state it will pay better than any other crop.

Mrs. Farrand states in her article on "Christmas Greens" that "we are most of us to blame through ignorance, because we do not know that one thin and poor yard of laurel-roping uses up at least twenty growths of one year each, and that over thirty are needed to make the pretty, thick strands we all have liked to buy. A good wreath of Holly is made up of an average of two years' growth. The cases of Holly sold in all the large florists' shops and market at Christmas time measure approximately three feet long and two feet wide and at least two feet high: each of these boxes contain a minimum of six hundred years of growth. It is therefore not difficult to understand why Holly has been practically exterminated from the State of Connecticut and is growing difficult to find in New Jersey and nearby States."

The Century Dictionary gives 36 names of places in which the word Holly occurs, and its range in the eastern part of the United States—from Maine to Florida, and westward to Pennsylvania, Missouri, and Texas—would seem to assure us that Holly was formerly abundant and widely distributed in the Eastern States. It has disappeared almost entirely from the Northern States and is rapidly diminishing in the Southern; all that comes to market is obtained from wild plants, and much of it is taken without the consent of the owners.

Holly plants, 2, 3, and 4 years old grown from seeds sown in January.

We are advocating the replanting of Holly from seeds by everyone who uses Holly for Christmas decorations, and the growing of Holly from cuttings by dealers to supply the ever-growing demand for living plants. Bailey, in the Standard Cyclopedia of Horticulture, says that the seeds do not germinate until the second year, that young seedlings should be transplanted after they are two years old, and that all or nearly all, of the leaves should be stripped off from *Ilex opaca* and *I.*

aquifolium when transplanted—particularly if at all exposed to wind and sun—as it is absolutely necessary to insure success. Holly will stand a certain amount of shade and can be planted without stripping off the leaves. At the New York Botanical Garden we have germinated the fruits taken from a hardy tree in the fruticetum in 8 months by planting them early in January in a mixture of sand and leaf-mould. Friends tell me that when planted in pots with their house plants, they can grow them readily from berries that have been used at Christmas-time, and in a few cases, those thrown out-of-doors have germinated.

Fortunately for us all, we shall not have to give up the use of this symbolic decoration for long, for in Oregon they are growing the European Holly commercially; there are many Holly farms near Portland, Oregon, and opportunity to raise enough of it to supply the nation. Many follow the custom of selling their surplus Holly, and florists will trim trees and hedges properly and buy the cuttings. These sell for a dollar a pound and are shipped to Chicago and New York. The moist and equable climate of the west coast from British Columbia to California is so similar to that of England that all the delicate and variegated varieties of *Ilex aquifolia* flourish, the English and Dutch, those with the silver and gold margined leaves, and the variety known as *Aurea regina*. In comparison with the Holly native on the Atlantic Coast, the leaves of all these varieties are much more dense and glossy, the spines more sharply pointed, and the berries are borne in clusters—on the whole, a much more durable and decorative species and one that is ultimately bound to supplant our own *Ilex opaca*, as this diminishes and *I. aquifolia* increases in abundance. But for the sake of "Auld Lang Syne" and the birds, let us grow our own Holly and create a demand for living plants by refusing to buy cut Holly!

Elizabeth G. Britton,
Botanical Garden.
Sec'y-Treas. Wild Flower Preservation Society of America.

FIVE NEW SPECIES OF LOBELIACEAE

H. A. Gleason

Centropogon poasensis n. sp.

Stem woody, densely and coarsely ferruginous-stellate above, becoming glabrous 2–3 dm. from the summit, the internodes about 1 cm. long; petioles stout, densely tomentose, 10–15 mm. long; leaf-blades thin, dull green, oblong-elliptic, 35–60 mm. long, 17–25 mm. wide, the uppermost somewhat smaller, abruptly acuminate or slightly falcate, sharply spinulose-denticulate with black, callous, subulate-triangular, salient teeth (5–6 teeth per cm. of margin, 0.3–0.5 mm. long), obtuse to subrotund at base, sparsely stellate along the midvein and glabrous on the surface above, coarsely ferruginous-stellate below, especially on the veins; lateral veins about 5 mm. apart, broadly divergent, the veinlets obscure; peduncles axillary, slender, spreading, 3–5 cm. long, densely ferruginous-tomentose, subulately bracteolate near the base; hypanthium broadly hemispherical, 4 mm. high, 7–8 mm. wide when pressed, densely tomentose at the base, sparsely stellate above; sepals erect, triangular-subulate, 3 mm. long, sparsely and minutely denticulate, thinly stellate, especially at the margin; corolla about 28 mm. long, red, prominently and coarsely stellate, especially toward the summit, the tube lightly curved, the lobes linear-falcate, strongly decurved; filaments exserted 6–10 mm., prominently white-villous; anther-tube 7 mm. long, lead-color, sparsely pilose in the fissures, the two lower anthers penicillate.

Type, *Smith 6626*, collected Mar. 1896, Volcan Poas, Prov. Alajuela, Costa Rica, altitude 2500 m., and deposited in the herbarium of the New York Botanical Garden. Duplicates of the type are in various other herbaria, and, so far as examined, agree exactly with it. A second collection from the same locality is *Pittier 2045*. The species was originally distributed by Capt. Smith as *Siphocampylus Regelii* Vatke, which is distinguished by its large leaves, 10–12 cm. long and 5–6 cm. wide, its shorter sepals, and its thin cinereous tomentum, composed of branched hairs only about half as large as those of *C. poasensis*.

Both species are true Centropogons, and show by their hypanthia, corollas, and tomentum their close relationships to a large group of species in northwestern South America. *Siphocampylus Regelii* Vatke is better known as *Centropogon costaricanus* Planch. & Oerst., a name which not only places the plant in the proper genus but has also the advantage of seventeen

years' priority. Zahlbruckner has regarded it as a variety of *Centropogon affinis* Mart. & Gal., a species of Guatemala and southern Mexico with which our plant has little real affinity.

Centropogon rubrovenosus n. sp.

Stems climbing, strongly grooved and angled above, glabrous or slightly verrucose below, minutely pilose near the nodes, the internodes 2.5–5 cm. long; petioles stout, 6–8 mm. long, minutely scabrous-pubescent; leaf-blades ovate, apparently rather fleshy, 6–7 cm. long, 3–4 cm. wide, broadest below the middle, gradually narrowed or abruptly subacuminate to a blunt apex, broadly rounded or subtruncate at the base, barely repand on the callous margin and denticulate with minute, callous, appressed teeth (2–3 teeth per cm. of margin, 0.1 mm. high), glabrous and dull green above, minutely and sparsely pubescent on the midvein beneath, the surface pale green; lateral veins plane, 8–12 mm. apart, arcuately ascending, the veinlets coarsely reticulate, the veins bordered and the veinlets marked by bands of dark red; inflorescence an elongate terminal raceme; peduncles slender, 2–3 cm. long, conspicuously pubescent at the base, sparsely pubescent above, ebracteolate; bracts ovate, 5–9 mm. long, petioled; hypanthium hemispheric, 3 mm. high, 7 mm. wide when pressed, very sparsely and minutely pilose; sepals reflexed, linear, 7–9 mm. long, minutely pubescent, 1-nerved; corolla red, strongly curved, sparsely pubescent, the tube about 28 mm. long, the lobes broadly triangular-falcate, decurved; filaments exserted 10–12 mm., glabrous; anther-tube 6 mm. long, glabrous below, the upper anthers pubescent with purple hairs at the tip, the two lower with a cartilaginous appendage.

Type, *Macbride 4104*, collected 20 May to 1 June 1923, Huacachi, near Muna, Peru, altitude about 6500 feet, and deposited in the herbarium of the Field Museum of Natural History. Closely related to *C. yungasensis*, from which it differs in its elongate racemes and its ovate, red-veined leaves.

Siphocampylus corynellus n. sp.

Stem shrubby, thinly tomentose above, the internodes 5–15 mm. long; petioles 8 mm. long; leaf-blades thick and firm, narrowly oblong-linear, 6–9 cm. long, 8–12 mm. wide, acute, finely denticulate, long-cuneate to the base, dark-green, glabrous, and strongly rugose above, densely white-tomentose beneath; peduncles axillary, 5–6 cm. long, erect; hypanthium broadly turbinate, 6 mm. long, 9 mm. wide when pressed, faintly ribbed; sepals erect, narrowly triangular, acute, separated by broad flat

sinuses 3 mm. wide; corolla white or pale yellow, 38 mm. long over all, the tube 15 mm. long, upper four lobes 23 mm. long, straight and erect, narrowly triangular, 2–3 mm. wide at the base, the lower lobe linear, separate nearly or quite to the base; anther-tube 11 mm. long, about equaling the petals, glabrous, all anthers densely woolly at the apex.

Type, *Matthews 1185*, collected in Peru, and deposited in the herbarium of the Royal Botanic Garden at Kew, England.

S. corynellus is closely akin to *S. corynoides* Wimmer, of which I have seen a sheet collected by Pearce and *Cook & Gilbert 1326*. The two are at once distinguished from the other species of the genus with short corolla-tube and pale flowers by the corolla, in which the lower lobe is separate from the others almost to the base.

Siphocampylus flavoruber n. sp.

Stem apparently herbaceous and erect, strongly and irregularly angled or subalate, thinly pubescent when young, glabrescent with age, the internodes 5–10 mm. long; petioles stout, 3–5 mm. long, sparsely hirtellous; leaf-blades firm, narrowly ovate-oblong, 45–75 mm. long, 15–25 mm. wide, or the upper smaller, acute or short-acuminate, broadly cuneate at base, finely and sharply fimbriate-denticulate with triangular-subulate, callous, salient teeth (about 20 teeth per cm. of margin, 0.3–0.8 mm. long), dull green, rugose, and minutely puberulent above, pale green and densely hirtellous with nearly straight white hairs beneath; lateral veins 2–5 mm. apart, ascending at an angle of about 45° and freely branching in their distal half, the veinlets finely reticulate; peduncles numerous, axillary, forming a leafy terminal raceme, 25–45 mm. long, densely white-hirtellous, frequently twisted or contorted 6 mm. from the summit; bracteoles filiform, 3 mm. long; hypanthium broadly turbinate-pyriform, 6–8 mm. high, 7–9 mm. wide when pressed, prominently 10-ribbed, minutely white-hirtellous; sepals erect or slightly spreading, triangular-subulate from a dilated base, 5 mm. long, denticulate with 5–6 pairs of callous salient teeth, prominently 1-nerved, conspicuously white-hirtellous; corolla 4 cm. long over all, red above, yellow on the ventral half, minutely and sparsely pubescent, the tube 22 mm. long ventrally, 26 mm. dorsally, the lobes linear, the lower 18, the upper 14 mm. long; stamens about equaling the corolla, the filaments glabrous, the anther-tube glabrous, greenish-brown, 7 mm. long, the two lower anthers penicillate.

Type, *Bro. Julio 40*, collected in Bolivia, and deposited in the United States National Herbarium. Related to *S. tupaeformis*

Zahlbr., *S. foliosus* Griseb., and *S. nemoralis* Griseb., from which it is distinguished by its subulate, spinulose-denticulate sepals; more closely resembling *S. tupaeformis reduncus* Wimmer *ined.*, which has prominently reticulate leaves truncate at the base.

Siphocampylus fissus n. sp.

Stem woody, twining, scabrously pubescent above, the internodes 5–10 mm. long, later lengthening to 2 cm.; petioles stout, 4–6 mm. long, rough-pubescent; leaf-blades coriaceous, dark green, shining above, broadly ovate-oblong, 20–27 mm. long, 12–18 mm. wide, broadly rounded at the apex, truncate or broadly rounded at base, subrevolute at the cartilaginous margin, sharply and finely denticulate with subulate salient teeth (about 4 teeth per cm. of margin, 0.5 mm. long), glabrous and strongly rugose above, brownish-green and scabrously pubescent on the veins beneath, the veinlets prominently reticulate; peduncles axillary, 15 mm. long, densely pubescent, forming a leafy raceme; hypanthium turbinate, 3 mm. high, 6 mm. wide when pressed, densely pubescent; sepals erect, oblong, 1.5 mm. long, rounded at apex, thinly pubescent, separated by broad flat sinuses; corolla pale yellowish-green, the tube densely pubescent, 10 mm. long, 3–4 mm. wide when pressed, the lobes closely pubescent, narrowly linear, the upper 23 mm. long, the lower a little shorter; filaments equaling the upper corolla-lobes, glabrous below, puberulent at the summit; anther-tube 10 mm. long, glabrous, the two lower anthers penicillate.

Type, *Macbride 4863*, collected 16–24 June 1923, Playapampa, Perú, altitude about 9000 feet, and deposited in the herbarium of the Field Museum of Natural History (duplicate in herb. of New York Botanical Garden). A relative of *S. Purdiaeanus* Planch. and *S. secundus* Wimmer, as shown by the deeply cleft corolla; differing from the latter in its broad blunt leaves and pubescence and from the former in its small, rugose, shining leaves.

New York Botanical Garden.

SOME EXTINCT OR LOST AND REDISCOVERED PLANTS, II.

Astragalus labradoricus, DC.

P. A. Rydberg

This was first described as *Astragalus secundus* Michx. (Fl. Bor. Am. **2**: 66. 1803). Michaux gives the following description:

"secundus: A. caulescens, procumbens: spicis pedunculosis; leguminibus secundis, pendulis, nigricantibus.
Obs: Minutim pubescens, foliola ovalia; flores purpurascentes: legumina recta, utrinque longiuscule accuminata.
Hab: in septentrionalibus Canadae."

Pursh in his Flora (p. 473, 1814) gave practically the same description, only recasting Michaux's words, and added the following distribution; "In the north of Canada, *Michaux*. Labrador, *Colmaster*."

As there was an older *Astragalus secundus*, DC., 1802 De Candolle (Prodr. **2**: 473. 1825), changed the name to *Astragalus labradoricus*, copying Pursh's description almost verbatim.

Torrey and Gray in their Flora (**1**: 331. 1838) copied De Candolle's description, adding in a note below: "Legume about ¾ of an inch long, clothed with blackish hairs, somewhat stipitate, half 2-celled. Cells 3–4-seeded." As they did not add anything to the distribution, it is evident that the species had not been collected in the meantime. In fact the plant has been lost for about one hundred years.

Amos Eaton included *A. secundus* in all the seven editions of his manual from 1817–1836, paraphrasing Pursh's description, without giving any additional matter, so also Eaton and Wright in their Botany of 1840.

Alfonso Wood omits it in both his Class Book and his Botanist and Florist, and so did Gray in his Manual, probably because they regarded it as extra-limital. It is also omitted in Britton's manual and in Britton and Brown's Illustrated Flora.

In his monograph of Astragalus (Proc. Am. Acad. **6**: 205. 1863), Dr. Gray made *A. secundus* Michx. and *A. labradoricus* DC. synonyms of *A. alpinus* L. In this interpretation he was followed by Watson (see Bibl. Ind. 190. 1878). This seems to have settled the matter until lately.

Marcus E. Jones in his revision of Astragalus (p. 133, 1924) has taken up the name *A. labradoricus* and has given as synonyms *A. secundus* Michx., *A. Blakei* Eggleston, *A. Robbinsii* v. *Jesupi* Sheld., *A. Macounii* Rydberg. On the following page he referred to it as varieties *A. Robbinsii* Oakes and *A. Robbinsii* v. *occidentalis* S. Wats. On page 135, he added the statement that *A. Macounii* is a form intermediate between the latter and the true *A. labradoricus*. He gives no reason for such a conclusion and none of these forms fulfill the character given by Torrey and Gray who stated that the pod is "half 2-celled." Mr. Jones was in this case, as usually, very positive in his statement, even if he was merely guessing.

Somebody may ask: How could Torrey and Gray add the character given above, when the plant had not been collected since Michaux's and Kohlmeister's (Colmaster's) time? There are in the Torrey Herbarium two pods with the following label:

"[A. alpinus!] Astragalus secundus Mx. Labradoricus DC. Herb. Mx."

In other words the pods are from the type in Michaux's herbarium in Paris. These pods are light-colored, with minute scattered appressed black hairs, straight on the upper suture, and tapering at each end more than in the typical *A. alpinus*. They are not like the pods of either *A. Blakei*, *A. Jesupi*, *A. Robbinsii*, or *A. Macounii* but belongs to the *A. alpinus* type. They can be matched by several on the type sheets of Fernald's *A. alpinus* v. *Brunetianus*, (*Fernald 24*). (See description in Rhodora **10:** 51, 1908, or in Gray's New Manual, 516, 1908.) It may be added that sometimes the upper suture is even slightly turned upward. In the typical *A. alpinus* the two sutures are almost equally convexly curved. In *A. labradoricus* or *A. alpinus Brunetianus*, whichever name is preferred, the flowers are usually lighter-colored and the petals comparatively narrower than in the true *A. alpinus*.

Fernald states that it represents *A. giganteus* (Pall.) Sheldon. Sheldon may have included some specimens belonging to *A. labradoricus* in it, but it was based on *A. alpinus* v. *giganteus* Pallas of Siberia, which is probably related to *A. oroboides*. The Rocky Mountain specimens mentioned by Sheldon and also referred to in the Gray's New Manual do not belong to *A. labradoricus*, which is confined to northern New England and

eastern Canada. We have records of specimens from Labrador, eastern Quebec, Newfoundland, New Brunswick, Maine, New Hampshire, and Vermont.

New York Botanical Garden.

DEMONSTRATION OF PROTOPLASMIC MOTION.

Arthur P. Kelley

Demonstration of protoplasmic motion is customary in classes in biology and elementary physiology. Satisfactory material however is not always to be found.

Living amoebae well show streaming motion of naked protoplasm but amoeba may not be available when desired. *Elodea* leaf-cells show evident rotation, large chloroplasts aiding the student to trace the motion. But active motion is often found in the middle of the leaf where underlying cell walls confuse the student as to the true course of the motion. Or, we may use *Trianea* root-hairs for protoplasmic circulation, but *Trianea* seems difficult to grow in city water. Staminal hairs of *Tradescantia* are of course available only when the plant blooms.

In our elementary classes we have found a dependable and satisfactory object for demonstration in the pollen tubes of *Vinca rosea* L. *V. rosea oculata* is equally useful. The plant grows readily from cuttings, requires no special conditions and only ordinary care which may be given in a small greenhouse. It is in bloom constantly; one is always sure of securing pollen. This pollen is germinated in a hanging drop of 10% sugar solution. Usually within two hours tubes long enough for study are formed; active streaming motion is readily seen within the thin pollen tube wall.

Rutgers University.

NOTE ON FAGUS ANTIPOFII

T. D. A. Cockerell

Having just acquired a copy of the work by H. Abich, Beiträge zur Paläontologie des Asiatischen Russlands (1858), I have been

interested in looking up the history of *Fagus antipofii*, which is first described and figured therein. The type came from the Tertiary of the Kirghis Steppe, north of the Aral Sea. Both Knowlton and Penhallow credit the species to Abich, but it is clear from the remarks at the end of the introduction and the credit given in the list of figures on the plates that the plant was described and named by Heer, and it should be so credited. In 1877, Heer figured a number of leaves from the Miocene of Sachalin, ascribing the species to himself. The figures show a plant apparently just like the original one, except fig. 7d on plate 2. This last has an undulate margin, and is suggestive of *Fagus undulata* Knowlton, which comes from the Fort Union of Yellowstone Park, and is presumably the species which Lesquereux had identified as *F. antipofii.*. This *Fagus undulata* shows considerable resemblance to *Quercus grönlandica* figured by Heer from the Miocene of Spitzbergen, and the living Chinese *Q. aliena* Blume, but there is at present no proof that it is not a *Fagus*. Kryshtofovich in 1921 published an account of specimens ascribed to *F. antipofii* (writing it *antipovii* Heer) from the Tertiary of Posiet, on the coast of Siberia just above the Korean boundary. The figures show a narrower leaf, with the secondaries less crowded, and the margin distinctly undulate. Surely this is not *F. antipofii*, but more likely a new species. Schenk intimates that *F. pristina* of Saporta, from the south of France, is identical with *F. antipofii*, but later authors have treated it as distinct. In 1921 Kryshtofovich also recorded *F. antipofii* from Chang-gi in Korea, but I suppose it was the same as the Posiet plant. Heer recorded *F. antipofii* from the Kenai (Eocene) of Alaska, finding it similar to the Sachalin and Kirghis plant. Sir Wm. Dawson reported the species from the Oligocene of Quesnel river, British Columbia, but the identification should be confirmed. It is also said to occur in the rocks of Greenland and Japan.

As matters now stand, it appears probable that *F. antipofii* existed in America only in Alaska and perhaps Greenland. There is no really reliable United States record, so far as I can learn. It may be defined as a broad *Fagus*-like leaf with numerous (13–16) pairs of secondary nervures, and entire margins. That all leaves of this type belong to one species, or even to the genus *Fagus*, cannot be certainly known. Who would ever imagine

that the leaves of the Japanese *Acer carpinifolium* Sieb. & Zucc. which I saw growing in Kew Gardens, were those of a maple? I could hardly believe my eyes, but there were the maple fruits.

UNIVERSITY OF COLORADO, BOULDER, COL.

BOOK REVIEWS

A TEXTBOOK OF GENERAL BOTANY FOR COLLEGES AND UNIVERSITIES*

This new textbook by Holman and Robbins is well planned and clearly written. It gives the student a general survey of the field and at the same time is not too comprehensive to serve as a general text for the first year of college botany. The book is divided into two parts. Part I deals with the higher plants, starting with the single cell and then taking up the different portions of the plant. Part II commences with the lower forms and works upward to the seed plants. It includes as well a chapter on heredity and evolution. This plan would seem to be the most logical way to attack the subject, since the higher plants are perhaps the first to attract the attention of the elementary student and at the same time they give an easy avenue of approach to the more lowly organized forms.

Each chapter has an outline of the contents at the beginning with reference to the pages where the subject is treated. This makes an excellent outline for study, showing the main divisions and the relation that the topics bear to one another. The book is well and fully illustrated and the drawings carefully labeled. Structure is discussed first, in order that the student may have a clear idea of the function, which is not left for a separate chapter, but the physiology of the organ is taken up immediately after its morphology. While morphology is so well and clearly dealt with physiology is not neglected, for there is a considerable amount of space devoted to the latter. This is a decided step in the right direction, since this side of the problem is very often overlooked, or rather poorly treated in an elementary course in botany. The authors have succeeded in giving us a well balanced

* Holman, Richard M. and Robbins, Wilfred W. A textbook of general botany for colleges and universities. 590 pages. John Wiley & Sons. New York. 1924. $4.00.

text combining so much physiology and morphology with other branches of botanical science. The book has a great deal to recommend its adoption in those colleges in which a text is used.

C. L. Carey.

The New England-Acadian Shore Line*

The book treats of the development of the shore line, its relation to rock structure, and especially to the geological and physiographic history of the region. Of local interest is the tracing of similarities between the Hudson River-Newark Bay region, the Connecticut Valley and the Bay of Funday in all of which trap ridges, cut across diagonally by faults, form one part of the shore line. Glacial action, except by deposition, has had slight effect on the coast line, deep narrow bays frequently referred to as fjords being drowned river valleys. The only examples of true fjords are in the Mount Desert Island embayment and the drowned gorge of the Hudson in the Highlands. The general conclusion is drawn that the shore line is extremely youthful, only a few thousand years at, or near, the present level. In the softest rocks the wave erosion has cut only a thousand feet or so, while the amount of beach and bar building, even when using material furnished by the glaciers, is comparatively slight. The coast north of New York is one of recent submergence, reaching at least twelve hundred feet in the northern part, while to the south it is one of emergence. There was probably a long-enduring costal plain from New Jersey and southward to beyond Newfoundland at least to the close of the Tertiary period. This physiographic history seems to offer a reasonable explanation of the facts described by Hollick and Fernald of the occurrence of Pine Barren plants along the coast as far north as Newfoundland.

Of chief interest botanically are the chapters on costal marshes and swamps. Three types of marshes are distinguished along the Atlantic Coast, differing in the composition of the sub-soil, peat or silt in various mixtures. While these different types are somewhat unlike in appearance they have had similar histories.

* Douglas Johnson, The New England-Acadian Shore Line, pages xx, 608, John Wiley and Sons, New York, 1925. Price $8.50.

The subsidence has been so gradual that the marsh grasses have grown uninterruptedly, till in places the roots and dead stalks can be followed from the growing grasses above high tide level to a depth far below the lowest ranges of the tide. The history of the marshes is discussed, their encroachment on fresh water swamps, their change due to bars forming between them and the sea, their burial under dunes, their destruction by changing currents and their reclamation by man. In addition to the definite evidence of slow post-glacial subsidence there is in places fictitious evidence of very recent subsidence, as in the case of drowned forests. It is shown that in many of these cases the forests developed at the edges of swamps and were destroyed by the natural or artificial opening of bars allowing the sea to enter and causing the formation of marshes. When marshes are drained or covered by drifting sand the peat level becomes considerably lower by drying and compression. Very interesting accounts are given of individual marshes along the Long Island and New England coast and especially of those of the Fundian region. In this latter there is found in one place a forest of stumps, with blackened rootstocks of ferns between, exposed on the side of the bay where it is covered at high tide by thirty feet of water. Apparently these stumps extend under the surface of the neighboring marsh. Though thousands of years old, the forest was composed of the same species that cover the near-by ridges today:—spruce, hemlock, birch, alder, ash, elm and other trees.

The book is interestingly written, well illustrated with maps, diagrams and photographs, printed on good paper and well bound in cloth. With each chapter there are extended references to the literature on the subject. While the chief interest will be for physiographers, there is much which the botanist will find of value.

George T. Hastings.

A List of the Plants of El Salvador.*

The flora of El Salvador, the smallest of American republics, has until recently been as little known as that of any Central

* Paul C. Standley and Salvador Calderón, Lista Preliminar de las Plantas de El Salvador. 8°, pp. 174, n. d. (published 14 Feb. 1925). Tipografía La Unión, San Salvador, El Salvador.

American country. Specimens in herbaria from El Salvador were very few, and the only list of the plants was the very imperfect "Flora Salvadoreña" of Dr. J. Samuel Ortiz. The collections made in El Salvador in 1921–2 by Mr. Paul C. Standley of the U. S. National Museum, together with extensive collections made then and subsequently by Dr. Salvador Calderón, co-author of the work under consideration, and other local botanists, have made possible the preparation of this Preliminary List of the Plants of El Salvador, which is the first approximately complete flora of any Central American country to be published. The introduction gives an account of collections made in El Salvador, of vernacular names (in which the Nahuatl element is especially noteworthy), of the affinities of the Salvador flora, and of persons who assisted in the collection of material for the work. The list proper, containing some 2070 species, is arranged in systematic order by families, the genera and species being listed alphabetically. Under each species are given the vernacular names (1500 of these are recorded altogether), the localities where collected, notes on economic uses, these sometimes of considerable length, and often (always in the case of trees or shrubs) a brief note of the color of the flowers or the habit. The bulk of the list consists of flowering plants and ferns, but the fungi, lichens, hepatics, and mosses so far known are included, although this part of the work is necessarily very incomplete. Cultivated plants are included, and distinguished by an asterisk. The proof reading of the list has been carefully done, and its appearance is a credit alike to the authors and to the printers.

The identifications have been made principally by Mr. Standley, with the assistance of specialists in various families. A considerable number of species discovered by the authors or their correspondents are indicated as new, without characterization. A few of these are nomina nuda, but nearly all those to which the name of Mr. Standley is attached were described by him in a series of papers in the Journal of the Washington Academy of Sciences in 1923 and 1924. The new combinations published in this work appear to be the following (all by Mr. Standley):

Ananas magdalenae (André) (p. 45), *Athyrocarpus rufipes* (Seub.) (p. 47), *Dichorisandra hexandra* (Aubl.) (p. 48), *Sabadilla officinalis* (S. & C.) (p. 49), *Taetsia fruticosa* var. *ferrea* (Baker)

(p. 50), *T. stricta* (Endl.), *Struthanthus oerstedii* (Oliver) (p. 72), *Sapranthus nicaraguensis* (Seem.) (p. 84), *Zornia diphylla* var. *sericea* (Moric.) (p. 119), *Hybanthus brevis* (Dowell) (p. 152), *H. riparius* (H.B.K.), *Parsonsia balsamona* (C. & S.) (p. 159), *Ardisia paschalis* (Donn. Sm.) (p. 168), *Nymphoides humboldtianum* (H. B. K.) (p. 172), *Vincetoxicum salvinii* (Hemsl.) (p. 178), *Godmania aesculifolia* (H. B. K.) (p. 200), *Coleosanthus paniculatus* (Mill.) (p. 219).

S. F. Blake.

PROCEEDINGS OF THE CLUB.

Meeting of March 28, 1925

This meeting was held at the Museum Building of the New York Botanical Garden. Dr. R. A. Harper was appointed temporary chairman.

Miss Catharine Dutcher, Apt. 53, 417 W. 118th St., New York, N. Y., was elected to membership in the Club.

The following resignations were accepted by vote of the Club: Mr. G. E. Orphal, 570 Smith Street, Brooklyn, N. Y., Miss E. F. Andrews, 419 East First St., Rome, Georgia.

The Secretary reported that the name of Professor A. D. Selby, a member of the Club of long standing, was unfortunately omitted in the necrology for 1924. Professor Selby was at one time president of the American Phytopathological Society and for nearly 30 years botanist of the Ohio Experiment Station. He died May 7, 1924.

By vote of the Club the treasurer was authorized to reimburse Dr. G. H. Shull for his traveling expenses incurred incident to his lecture March 10, 1925.

Dr. Harper, speaking of the loss by resignation during the past year of two members who served terms as officers of the Club for considerable periods, suggested tentatively the advisability of amending the constitution to the effect that those holding responsible office 3, 4, or 5 years (the length of tenure to be decided) should automatically, in case they move out of town become life members and become exempt from dues.

The scientific part of the program consisted of a talk by Dr. Susan P. Nichols, of Oberlin College, entitled "Some reactions

to wounds in plant cells." Dr. Nichols found that the coarser algae lend themselves admirably to this investigation, the plants being mounted in water and punctured freehand with a steel needle. In *Chaetomorpha melagonium f. typica*, after the puncture of a cell, a clear liquid comes out and passes into the water. Within a second or two starch grains, etc. begin to accumulate at the opening, forming a plug, which turns dark in a few minutes and apparently hardens, closing the opening. In two minutes all movements from the cell into the water has usually ceased. By plasmolyzing, it can be demonstrated that in about 45 minutes a new membrane has started to form underneath the base of the plug. In 1½ hours the membrane is completely formed and a new cell wall is gradually deposited. The plug gradually becomes transparent and in a month has disappeared.

In Nitella the circulation of the protoplasm with its plastids, makes the results easy to follow. A certain number of plastids, loosened by the needle, rush out into the water, but the other cell contents do not diffuse as in Chaetomorpha. The membrane is formed apparently as in Chaetomorpha. Rotation of the protoplasm, which may cease immediately at the time of puncturing, it resumed simultaneously very soon after, throughout the internode, with the exception of an area near the wound. The renewed movement increases until the normal rate—1.5–2 seconds per 80 μ—is reached. A mass collects about the wound, which interferes with the movement here, but otherwise the movement is normal 24 hours after wounding. On repuncturing in the same cell after a short interval, 1–2 minutes, the same process is repeated, but the time necessary for the normal movement to be regained is longer. When punctures are frequent but after a longer interval, 10–15 minutes, recovery is more and more rapid, possibly because the available plastids are fewer and so do not hold the wounds open. One internode was punctured 87 times and its final death may not have been from this cause. A new cell wall is formed just as in Chaetomorpha.

Other subjects employed in the experiments were Vaucheria; Spirogyra, which, although used successfully, was difficult to puncture; Chara, the cortical cells of which never healed, although the internodal cells did; Elodea, the leaf cells of which, although forming a plug, invariably died after 24 hours; Bryum, in which not even a plug is formed; and cells of fern prothallia and An-

thoceros, which did not heal.—In the subsequent discussion it was suggested that the process seemed similar to the clotting of blood. As a result of the coagulation, toxic products may be formed which interfere with the life processes. The fact that recovery is more rapid after repeated woundings may be due to the formation of anti-bodies in the cell which neutralize the effect of these toxins.

ARTHUR H. GRAVES,
Secretary.

MEETING OF APRIL 14, 1925

The meeting of this date was held at the American Museum of Natural History.

Three candidates for membership were elected to the Club: Miss Laura Alma Kolk, Brooklyn Botanic Garden; Miss Lilian H. Mandell, 3515 97th Street, Corona, Long Island; Miss Mollie Sobel, 754 Vermont Street, Brooklyn.

The scientific part of the program consisted of an illustrated lecture by Professor M. L. Fernald of Harvard University, entitled "The Floras of the Unglaciated Regions of Eastern Canada and Newfoundland."

Dr. Fernald gave a resumé of a paper which is now in the course of publication, showing by means of lantern slides maps the distribution of many of the plants of the Gaspé Peninsula, the Magdalen Islands and the Long Range of Western Newfoundland. The peculiarity of the flora of these regions is that to a large extent it is identical with, or closely related to the floras of western North America rather than eastern America and the Arctic regions. These areas, centering about the Gulf of St. Lawrence, have a large endemic element in their flora which is likewise more closely related to plants of the Rocky Mts. or of the Pacific slope than to other regions. The areas of Gaspé and the Magdalen Islands, where such plants occur, have been well demonstrated by geological explorations to have escaped the Pleistocene glaciation; and the botanical evidence as well as the topography of the Long Range indicates a similar history for that region, although the geological exploration there has been limited. A review of Pleistocene history in America and in Europe was given, and it was shown that many of the plants

which are common to the Pacific slope of North America and to the Gaspé Peninsula or western Newfoundland are otherwise known only in the Arctic Archipelago which was north of the continental glaciers of America. Similarly, about 70 species, common to unglaciated arctic America and the unglaciated mountains of Gaspé and the mountains of the western United States or adjacent Canada, are known in Europe only in arctic Russia and Nova Zembla or sometimes in limited areas on the Kola Peninsula. These regions lay to the northeast of the great continental ice sheets which in Europe radiated in Pleistocene time from the Scandinavian mountains, and the speaker pointed out that the flora which is made up of these species which outlived Pleistocene glaciation on isolated unglaciated spots may be considered the ancient arctic flora, since it has shown little, if any, inclination since the waning of the Pleistocene glaciers to take possession of the adjacent regions which were covered by continental ice. A younger artic flora which, during the latest advances of the Glacial Period, reached southern Europe and the mountains of New England and New York, now occupies both unglaciated and glaciated regions to the northward and shows no such conservatism as the species which characterize the mountains of Gaspé and western Newfoundland. A detailed analysis of the situation will soon be published.

Arthur H. Graves,
Secretary.

NEWS NOTES

Mr. Ellsworth Bethel, who has been Curator of the Department of Natural History for the Colorado State Museum, died suddenly on Sept. 8. He was well known for his work in forestry and at the time of his death was Pathologist for the United States Bureau of Plant Industry. He did a great deal to interest the people of Colorado in Natural History.

Mr. Rafael Toro, after two months of research in the New York Botanical Gardens, has returned to Porto Rico as assistant plant pathologist in the Agricultural Experiment Station at Rio Piedras. Dr. Mel T. Cook will be associated with Mr. Toro in this work.

Prov. J. M. Coulter, for many years head of the Department of Botany at the University of Chicago, has moved to Yonkers where he is now Scientific Advisor of the Vance Thompson Institute for Plant Research. Prof. Coulter has recently become a member of the Torrey Club.

A dinner was recently given by Dr. N. L. Britton of the New York Botanical Gardens in honor of Dr. F. Bower of Glasgow who is spending a few months lecturing in the United States. A large number of botanists representing the different Botanical Institutions and the local colleges were in attendance.

A recent notice in the daily papers describes a plan made by the Pan-Pacific Biology Commission to make the Island of Ohau of the Hawaiian group a Pan-Pacific Botanical Garden. It is planned to grow on the Island every kind of tropical fruit and other plants of economic importance, while on the mountain slopes will be grown economic plants from other parts of the world. Many plants from other parts of the tropics are already being grown on the research grounds of the Pan-Pacific institute of Ohau and seed and cuttings are being constantly received.

The Torrey Botanical Club

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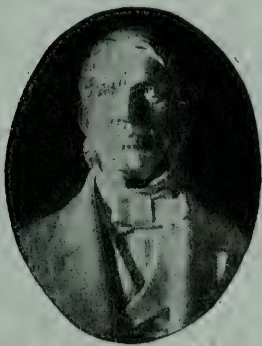
EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS



John Torrey, 1796-1873

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FERNS AND FLOWERING PLANTS OF THE HEMPSTEAD PLAINS, LONG ISLAND, NEW YORK

William C. Ferguson

The Hempstead Plains will soon be a memory. Suburban building, farming, and golf links are fast encroaching on this prairie. The writer is familiar with two publications relating to the Hempstead Plains* and although the following list is in large part a repetition of plants recorded in the publications referred to, it includes some others. The list is confined entirely to plants collected or observed by the writer during the past five years. All introduced plants, those growing on abandoned fields, or by the roadsides, have been excluded, so that only plants native to the Plains are recorded.

This list is incomplete, for the writer rarely goes out on the Plains without finding at least one plant not seen by him before. The names used agree with Britton & Brown's *Illustrated Flora*, with the exception of the genus *Kneiffia*, which is treated according to Pennell, Bull. Torrey Club **46**: 363–373. Oct., 1919, and Gramineae, according to Hitchcock & Chase. Except in *Kneiffia* and in the Gramineae, therefore, the authorities for the names are omitted.

The Hempstead Plains are mostly open, dry prairie, but there are two swampy areas, Meadowbrook stream and swamp, south of Westbury; and a stream and swamp northeast of the village of Hempstead, and some acres of woods, mostly *Pinus rigida*, south of Hicksville and near the southern edge of the Plains, locally known as the Isle of Pines.

Those plants marked P were found on the open plains.

Those plants marked I were found in the Isle of Pines.

* Hicks, Henry. Flora of the Hempstead Plains, Long Island. Thesis. Cornell Univ. 1892.

Harper, R. M. Vegetation of the Hempstead Plains. Memoirs Torrey Club **17**: 262–286. June 1918.

Those plants marked M were found in the Meadowbrook Swamp.

Those plants marked H were found in the swamp at Hempstead.

It will be observed that many plants are common to more than one locality.

Polypodiaceae

Dryopteris thelypteris—M
Onoclea sensibilis—M

Osmundaceae

Osmunda cinnamomea—M
O. regalis—M

Lycopodiaceae

Lycopodium adpressum—M

Pinaceae

Pinus rigida—I P

Sparganiaceae

Sparganium androcladum—M

Alismaceae

Sagittaria latifolia—M

Gramineae

Agrostis hyemalis (Walt.) B.S.P.—I P
A. perennans (Walt.) Tuckman.—M
Andropogon furcatus Muhl.—I P
A. scoparius Michx.—I P
A. virginicus L.—M P
Aristida dichotoma Michx.—I P
A. purpurascens Poir.—P
Danthonia spicata (L.) Beauv.—P
Syntherisma filiforme (L.) Nash—P
Eragrostis pectinacea (Michx.) Steud.—P I
Festuca octoflora Walt.—M
Panicularia acutiflora (Torr.) Kuntze—H
P. canadensis (Michx.) Kuntze—M
Panicum albemarlense Ashe—I P
P. capillare L.—I
P. columbianum Scribn.—I P
P. columbianum thinium H. & C.—P
P. implicatum Scribn.—P M
P. lindheimeri Nash—I P M H
P. longifolium Torr.—M H
P. lucidum Ashe—M
P. microcarpon Muhl.—M
P. sphaerocarpon Ell.—I
P. virgatum L.—I
P. virgatum cubense Griseb.—I P M H
Paspalum muhlenbergii Nash—P
Sorghastrum nutans (L.) Nash—P I

Cyperaceae

Stenophyllus capillaris M
Scleria pauciflora—P
Scirpus cyperinus—M H
S. debilis—M H
S. americanus—M H
Rynchospora alba—M
R. capitellata—M H
Eriophorum tenellum—M
E. virginicum—M
Fimbristylis puberula—H
Eleocharis palustris—M
E. olivacea—M
E. capitata—M
E. tuberculosa—M
Cyperus filiculmis—M P I
C. strigosus—I
Carex annectens—P
C. albolutescens—I M
C. canescens—M
C. folliculata—M
C. lanuginosa—H
C. lupulina—H
C. lurida—M
C. pennsylvanica—M P I
C. scoparia—M H
C. vulpinoidea—H
C. emmonsii—M

Eriocaulaceae

Eriocaulon septangulare—M

Xyridaceae

Xyris flexuosa—M

Juncaceae

Juncus acuminatus—M H
J. canadensis—M H
J. dichotomus—M H P
J. effusus—M H
J. greenei—I P
J. marginatus—M
J. pelocarpus—M
J. scirpoides—H
J. tenuis—H M I P
Juncoides campestre—M

Liliaceae

Aletris farinosa—P I

Convallariaceae

Polygonatum biflorum—I
Vagnera racemosa—I

Smilaceae

Smilax rotundifolia—I

Amaryllidaceae

Hypoxis hirsuta—I P

Iridaceae

Sisyrinchium arenicola—I P
S. atlanticum—M

Orchidaceae

Limodorum tuberosum—M
Fissipes acaulis—I
Blephariglottis ciliaris—P I M
B. lacera—M
Pogonia ophioglossoides—M
Ibidium cernuum—M
I. gracile—P

Salicaceae

Populus grandidentata—P I
P. tremuloides—P I
Salix discolor—I
S. humilis—I P
S. tristis—I P

Myricaceae

Comptonia peregrina—I
Myrica carolinensis—M P

Betulaceae

Betula populifolia—I P
Corylus americana—I P

Fagaceae

Quercus ilicifolia—I P
Q. marylandica—P
Q. prinoides—P I
Q. stellata—P I
Q. velutina—P I

Santalaceae

Commandra umbellata—I

Polygonaceae

Polygonella articulata—P
Persicaria hydropiperoides—M
Tracaulon sagittatum—M

Phytolaccaceae

Phytolacca americana—I

Nymphaeaceae

Brasenia schreberi—M
Castalia odorata—M

Ranunculaceae

Anemone quinquefolia—M

Cruciferae

Radicula palustris—H

Droseraceae

Drosera rotundifolia—M
D. intermedia—M

Saxifragaceae

Chrysosplenium americanum—M

Malaceae

Amelanchier intermedia—M
Aronia atropurpurea—M
A. melanocarpa—P
Crataegus crus-galli—I

Amygdalaceae

Padus virginiana—P M
Prunus cuneata—I
P. maritima—M

Rosaceae

Fragaria virginiana—M
Potentilla monspeliensis—P I
P. pumila—P I M
Rosa palustris—M
R. virginiana—M P
Rubus frondosus—I.
R. nigricans—P
R. procumbens—P
R. hispidus—M
Spiraea latifolia—M H
S. tomentosa—M H

Fabaceae

Baptisia tinctoria—P I
Lespedeza angustifolia—P
L. velutina—P
L. velutina × *angustifolia*—P
L. hirta—P
L. virginica—I
Cracca virginiana—I P

Linaceae

Cathartolinum intercusum—I P
C. striatum—M H

Geraniaceae

Geranium maculatum—M P

Polygalaceae

Polygala cruciata—M
P. nuttallii—I P
P. polygama—P
P. viridescens—P I M

Euphorbiaceae

Tithymalopsis ipecacuanhae P

Anacardiaceae

Rhus copallina—P I
Toxicodendron Vernix—M
T. radicans—P

Ilicaceae

Ilex verticillata—M

Aceraceae

Acer rubrum—M

Rhamnaceae

Ceanothus americanus—I

Hypericaceae

Hypericum adpressum—M H
H. canadense—M H
H. mutilum—M
Triadenum virginicum—M
Sarothra gentianoides—P I

Cistaceae

Crocanthemum majus—P I
C. propinquum—P I
C. canadense— P I
C. dumosum—P I
Lechea maritima—P
L. minor—P I
L. villosa—P I

Violaceae

Viola bittoniana—P M
V. cucullata—M
V. cucullata × *brittoniana*—M
V. fimbriatula × *brittoniana*—M
V. fimbriatula—P I M
V. lanceolata—M P
V. pallens—M
V. pedata—M P I
V. primulifolia—M P I
V. emarginata—I

Cactaceae

Opuntia Opuntia—P

Melastomaceae

Rhexia virginica—M H

Onagraceae

Chamaenerion angustifolium—M P I
Ludwigia alternifolia—M H
Oenothera biennis—I P
Kneiffia fruticosa (L.) Raimann—P M
K. velutina Pennell—P
K. perennis (L.) Pennell—P

Ericaceae

Uva-ursi uva-ursi P
Neopieris mariana—P M
Xolisma ligustrina—M

Vacciniaceae

Gaylussacia baccata—P I
Vaccinium corymbosum—M H
V. angustifolium—I
V. vacillans—I P
Oxycoccus macrocarpus—M

Primulaceae

Lysimachia quadrifolia—I
L. terrestris—M

Gentianaceae

Bartonia virginica—P I
Dasystephana saponaria—M H

Asclepiadaceae

Acerates viridiflora—P
Asclepias amplexicaulis—P
A. pulchra—M
A. syriaca—P
A. tuberosa—P
A. verticillata—P

Convolvulaceae

Convolvulus sepium—P

Verbenaceae

Verbena hastata—M

Labiatae

Lycopus americanus—M H
L. uniflorus—M
Stachys hyssopifolia—M P
Trichostema dichotomum—L

Scrophulariaceae

Aureolaria pedicularia—I
Agalinis purpurea—M P H
A. acuta—P I
Gratiola aurea—M H
Linaria canadensis—P
Pedicularis canadensis—P

Rubiaceae

Diodia teres—P
Galium claytoni—M
Houstonia longifolia—P I

Caprifoliaceae

Sambucus canadensis—M H
Viburnum dentatum—M H

Lobeliaceae

Lobelia nuttallii—M H
L. spicata—P

Cichoriaceae

Hieracium gronovii—P I
Krigia virginica—P
Nabalus serpentarius—I

Compositae

Helianthus angustifolius—M
Sericocarpus linifolius—P I
Solidago altissima—M
S. juncea—M I
S. nemoralis—P I
S. odora—I
S. puberula—I P
S. rugosa—I M
Euthamia graminifolia—M
E. tenuifolia—M P I
Vernonia noveboracensis—M
Anaphalis margaritacea—P I
Antennaria fallax—P
A. neglecta—P
A. neodioica—P
A. plantaginifolia—P
Aster dumosus—P M I
A. novi-belgii—M
A. novi-belgii elodes—M
A. paniculatus—P H
A. patens—P
A. puniceus lucidulus—M
A. vimineus—H I
Ionactis linariifolius—P I
Bidens comosa—H
B. connata—M H
B. frondosa—M H
Chrysopsis falcata—P
C. mariana—P I
Cirsium odoratum—P
Erechtites hieracifolia—I
Erigeron ramosus—P
Eupatorium hyssopifolium—P
E. perfoliatum—M I
E. maculatum—M H
E. rotundifolium—P
E. torreyanum—P
Gnaphalium obtusifolium—P I

A BANYAN-LIKE COPPICE OF SOUR GUM
(*Nyssa sylvatica*)

JOHN W. HARSHBERGER

European botanists have given considerable attention to the growth forms of trees and an abundant literature has been the result of this line of study. American botanists have not treated this field of botanical inquiry with much consideration. The following note is put on record, as a contribution to this subject.

It is well known that the ailanthus (*Ailanthus glandulosus*), white poplar (*Populus alba*) of the introduced foreign trees and sassafras (*Sassafras variifolium*), as a native tree, produce abundant offspring in the form of suckers from the roots until the parent tree is surrounded by a thicket of young trees. Our native sour gum (*Nyssa sylvatica*) should be added to the list. On September 18, 1925, the accompanying photographs were taken of a sour gum coppice with the parent tree centrally placed, about which were grouped smaller trees that arose from its roots.* The central and taller tree was 3 feet 9 inches in circumference. There were 187 younger trees about the parent one with diameters ranging from one to three inches and extending in all directions. The coppice measured in a northeastern-southwestern direction 100 feet 6 inches, or 44 feet 8 inches from the parent tree to the northeastern side and 55 feet 10 inches from the central tree to the southwestern side of the coppice. Presumably the extent of the sour gum thicket was determined by the distance to which the roots of the larger tree spread. This interesting banyan-like coppice is found on a farm above Neshaminy Creek near Edison, Bucks County, Pennsylvania.

*A friend insists that these younger trees arose as seedlings from fruit dropped by the larger tree.

Coppice of Sour Gum Trees.

View inside the Coppice, Parent Tree near the Center.

A NEW SALVINIA FROM THE EOCENE

Edward W. Berry

The nominal fossil species of Salvinia number about a dozen, but they are always sufficiently rare to be of unusual interest. Several that have been described are poorly characterized or of doubtful botanical affinity so that the form which is the subject of the present note is well worthy of being called to the attention of botanists.

The most ancient known, as well as one of the best characterized, forms of Salvinia is *Salvinia Zeilleri* described very thoroughly by Fritel[1] and coming from the Sparnacian stage (lower Eocene) of the Paris basin. Next in point of age is the new species which is the subject of the present note.

This is represented by considerable material from the so-called Bridger formation of the Wind River basin in Wyoming collected by N. H. Brown; and by less extensive but more complete material from two localities in the Wilcox Eocene of western Tennessee collected by R. E. L. Collins. It may be incompletely characterized as follows:

Salvinia preauriculata Berry, n. sp. Figs. 1–4

Dorsal or floating leaves relatively thick, elliptical in outline, with a rounded apex and a rounded or slightly cordate base; varying in size, the maximum dimensions observed being 16 millimeters in length and 10 millimeters in width. The midvein is well defined. The laterals are thin, nearly straight, diverging at regular intervals, very ascending in the tip of the leaf, the angle of divergence increasing regularly proximad, the basal laterals being sometimes even slightly descending; they are connected by numerous thin and for the most part poorly seen oblique veinlets. The tubercles or pits lie in rows between the laterals and are usually well marked but somewhat irregularly developed. No ventral (submerged) leaves or sporocarps have been observed in the Wyoming material although spherical bodies about 2 millimeters in diameter are in close association with the leaves and these might possibly represent sporocarps. The specimen shown in fig. 4 from the Wilcox at Mandy, Tennessee,

[1] Fritel, P. H., Jour. Bot. (2) **1**: 190. 1908.

is unique in showing a complete, and what appears to be a fruiting plant. Four floating leaves, three of which are nearly perfect are clearly made out, as well as 14 thread-like divisions of the submerged leaves with their appendages. Several of these dissected submerged leaves appear to be complete and are 2.5 centimeters in length. Immediately beneath the lowermost and incomplete floating leaf are two small sub-spherical bodies about 1.25 millimeters in diameter, and these appear to be in organic union with the submerged leaves at their base and to represent sporocarps. These are brownish carbonaceous and of considerable consistency so that when the plant was buried and flattened in the mud the floating leaf was pressed over them, and when the clay was split the leaf film over them flaked off. Immediately beside these objects, which are interpreted as sporocarps, is a similar impression in the clay without any carbonaceous residue which might represent a third sporocarp.

There can not be the slighest doubt regarding the botanical affinity of this species, and although it is not possible to verify the interpretation of the sporocarps, they appear very convincing. In the Wind River basin this species is found on the same slabs with the fruits of Sparganium and other representatives of a lake side or slack stream vegetation. In Tennessee it is associated with a large and varied costal and lagoon border flora.

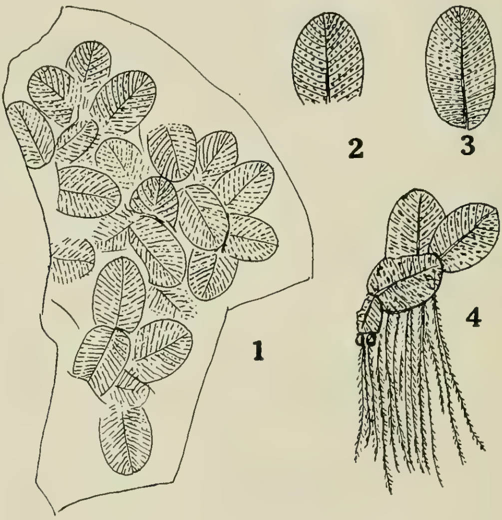
Occurrence: Bridger (?) Tipperary, Fremont County, Wyoming; Clover Creek, Hardeman County and Mandy, Madison County, Tennessee.

Salvinia preauriculata is so named because of its great similarity to the existing *Salvinia auriculata* Aublet, which ranges from Cuba and Central America to Paraguay. Among the described fossil species it is closest to *Salvinia Zeilleri* Fritel. The Wilcox beds in which it is found are correlated with Ypresian stage of the Eocene. The Wyoming occurrence, less certainly correlated, is somewhat younger and may belong in the Lutetian stage of the middle Eocene. If this is correct it would tend to indicate that this species had spread northward to Wyoming from Equatorial America during Eocene time.

The still existing species of Salvinia also number a dozen or more and they occur chiefly in the equatorial regions of both hemispheres, and are especially abundant in South America.

One species *Salvinia naians* Hoffm., ranges from southern France to India and northern China, and has been reported from several localities in the United States.

Continuing the enumeration of the fossil species it may be noted that there is a rather well marked species in the Puget group (upper Eocene or Oligocene) of Washington state; Miocene species in Colombia, South America; and in Virginia in this country. All of the remaining records are Old World, and include Oligocene species in France, Saxony, and Bohemia; and



SALVINIA PREAURICULATA Berry, n. sp.

FIGS. 1–3. Dorsal leaves from Tipperary, Wyoming.
FIG. 4. Nearly complete plant from Mandy, Tennessee.

Miocene occurrences in Germany, Bohemia, Switzerland, Transylvania, Tonkin, China, and Japan. These have been reviewed recently in an important paper by Florin.* Some of these species are said to show the dissected ventral leaves and sporocarps, and Brabenec, in a paper which I have not seen,† has described both micro- and mega-spores in *Salvinia formosa* Heer from the Miocene of the Saaz basin in Bohemia, but it is impossible to pass a critical judgment on a statement of this sort without seeing the specimens upon which it was based.

BALTIMORE, MD.

* Florin, R., Geol. Inst. Upsala Bull. **16:** 243–260. 1919.
† Brabenec, F., Rozpr. Ceske Akad. (2) 13. 1914.

A TREE'S DIAMOND JUBILEE

George T. Hastings

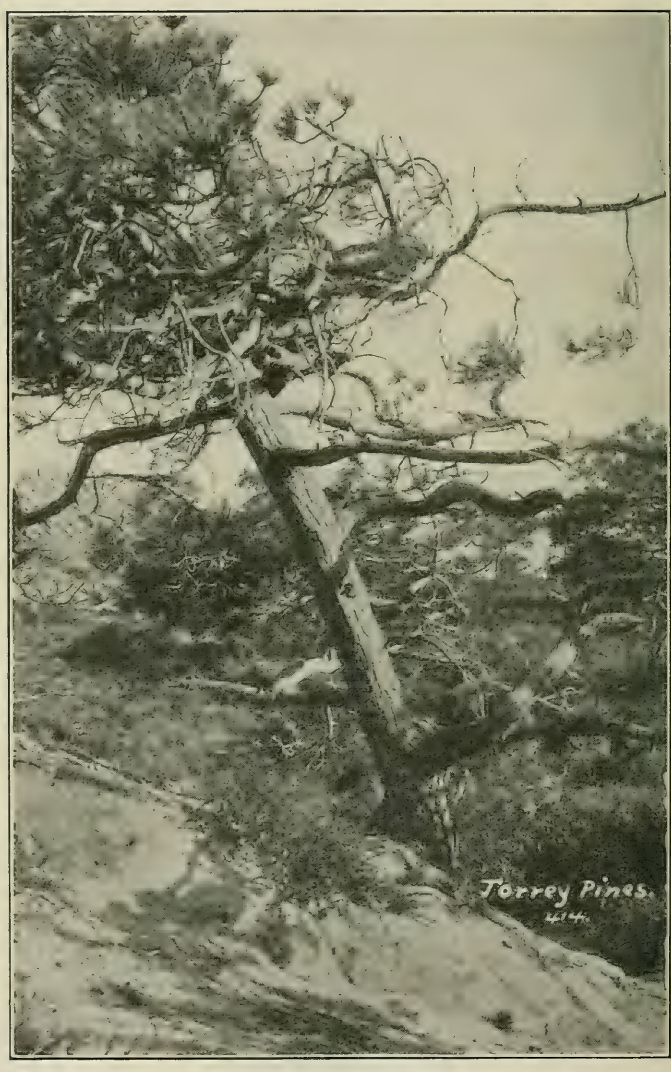
This fall exercises were held in San Diego, California, commemorating the seventy-fifth anniversary of the discovery of the Torrey Pines, *Pinus Torreyana.* These trees were discovered in the same year that California was admitted to the Union and are California's birthday trees. First found in April, 1850 by Dr. C. C. Perry, they were named in honor of Dr. John Torrey. It is probable, however, that Dr. Torrey never saw the trees. The original grove, some twenty miles north of San Diego is now the Torrey Pine Preserve, dedicated to the "preservation of the rarest of the pine trees and their companion shrubs and wild flowers." Besides this grove there is known one smaller one on Santa Rosa Island. Where the seeds of the Torrey Pine have been planted in other regions the trees grow tall and straight, not like the twisted, stunted trees on the promontory overlooking the Pacific. The following poem was written in connection with the jubilee celebration.

THE TORREY PINES

By W. B. France

Out where the old Pacific roars,
  Its breakers voicing a wordless rhyme,
Dashing forever on silent shores,
  Like waves of Life on the sands of Time,
With far-flung branches and roots that cling
  To painted canyons and steep inclines,
Proud of the story they lived to bring,
  They stand—the last of the Torrey Pines.

Eons ago, when man was young,
  From northern mountains their fathers strayed;
Age after age they lived and clung
  To cliffs that torrents and winds have flayed.
Fighting for life as years have wrought
  Their handicraft on the world they mould,
Gaining strength from the fight they fought,
  Still they stood till their tale was told.



An Old Torrey Pine

Faith is in them—a faith that sees
  The broader life of the singing spheres;
Faith in the Infinite God of Trees,
  Who counts a day as a thousand years.
Timeless ages they lived and grew,
  And carried on as their brothers fell;
Seeing only a work to do,
  Knowing only to do it well.

Thus, as we each must come and go,
We do our part as the ages climb—
Human forces that ebb and flow
  Like waves of Life on the shores of Time!
May we each, in the work we do,
  Whatever duties our fate assigns,
Keep the courage to see it through—
  Hold the faith of the Torrey Pines.

BOOK REVIEWS

Miss Lister's "Mycetozoa" *

The third edition of Lister's monograph of the "Mycetozoa" has just appeared. The first edition of this standard work on the slime-moulds appeared in 1894 and represented the results of many years of labor on the part of Mr. Arthur Lister. The drawings, many of which were in color, were executed by Mr. Lister and his able daughter Miss Gulielma Lister. Mr. Lister died July 19, 1908.

The widespread interest in the first edition resulted in bringing in much new material. As a result of this Miss Lister prepared a second edition, much enlarged and with improvements in the quality of the plates. The second edition appeared in 1911.

The third edition dated January 1925, includes three additional genera and forty-six new species. Some of the new species are raised from varietal rank. Twenty-two new plates have been added, eight of which are colored.

The appearance of this excellent monograph will be an invaluable aid to students of slime-moulds the world over, since many of these minute organisms are cosmopolitan in their distribution. Especially is the author to be congratulated on the number and excellence of the illustrations.—Fred J. Seaver.

* Monograph of Mycetozoa. Third Edition., British Museum, 1925. £ 1. 11.6.

Twenty-first Volume of "Natural Families of Plants" Appears

Engler, A.: Die natürlichen Pflanzenfamilien. 11 Band, Musci (Laubmoose) 2 Hälfte redigiert von V. F. Brotherus und 21 Band, Parietales und Opuntiales redigiert von E. Gilg. Leipzig, Verlag von Wilhelm Engelmann, 1925.

This note is written to publish the fact that the second part of the moss volume of the "Natural Families of Plants" has appeared, and should be added to the library of moss lovers. The twenty-first volume describes the characteristics of 33 families and their genera of flowering plants comprised in the orders *Parietales* and *Opuntiales.* The typography and the illustrations of these volumes leave little to be desired.

John W. Harshberger.

PROCEEDINGS OF THE CLUB

Meeting of April 29, 1925.

The meeting of this date was held at the Museum Building of the New York Botanical Garden. Mr. Charles Greenberg, 907 Fox Street, Bronx, N. Y. C., was elected to membership, and the resignation of Mr. Charles Dreyer, 147 East 55th Street, Brooklyn, was accepted with regret.

For the scientific part of the program, Dr. N. L. Britton exhibited a fossilized walnut which had been presented to him by a contractor making excavations in western Porto Rico. The nuts were found at a depth of about 60 feet in a lignitic layer of Araciba limestone, perhaps of tertiary origin. The nuts resembled somewhat the existing Juglans, but are smaller with the ridges less pronounced. They certainly indicate the existence of Juglans in the West Indies in very ancient times. This brings up the interesting question as to the place of origin of the genus Juglans, whether the new or old world.

The next paper was by Dr. A. B. Stout, entitled, "Recent studies of flower behavior of avocados." This tropical fruit, sometimes called alligator pear, is destined some day to become a great fruit crop. It is very nutritious, being rich in proteid and oil. The conditions for its cultivation in Florida and California are favorable.

With very few exceptions, all avocados have perfect flowers. Each flower normally has two distinct periods of opening: in the first opening the pistil is ready to be pollinated, and in the second the pollen is being shed. There is an interval of 12, 24, or 36 hours between these openings depending upon the weather conditions. As is evident, such a dichogamous condition prevents self-pollination. But the avocado goes a step further: its flowers open synchronously, i. e. on one variety only one kind of organ (stamen or pistil) matures at one time, e. g. the stamens in the morning, the pistils in the evening, or late afternoon. This prevents close-pollination. Varieties fall into two main groups with respect to the daily sequence of opening. In one group first-period flowers are open in the forenoon, and second-period flowers are open in the afternoon. In the other group, conditions are the reverse: the second-period flowers are open in the forenoon and the first-period ones are open in the afternoon. The avocados are thus most decidedly adapted for cross-pollination between members of these two groups, and to provide for proper pollination such varieties should be interplanted in commercial plantings.

The recent studies in Florida were made in cooperation with the Bureau of Plant Industry, The Florida Avocado Association, and the Daüe County Farm Bureau. The flower behavior of 124 named varieties and seedlings has been determined with special reference to the interplanting which will favor fruit production. The report of this investigation will soon be published in detail.

The next paper was by Dr. H. A. Gleason, and was entitled "The Lobeliaceae of South America." Specimens were shown and described of South American representatives of the large and important genera Burmeistera, Centropogon, and Siphocampylus. Dr. Gleason showed how the species clearly separate out into several groups depending on the character of the fruit, the nature of the inflorescence, the shape of the corolla, and the appendages of the two lower anthers.

Arthur H. Graves,
Secretary.

Meeting of May 12, 1925.

This meeting was held at the American Museum of Natural History. The following were elected to membership:

Prof. F. K. Butters, University of Minnesota, Minneapolis, Minnesota.

Miss Mary E. Wood, Johnson Hall, 411 West 116th Street, New York, N. Y.

Dr. Sheppard Shapiro, Montefioro Hospital, Gunhill Rd. and Bainbridge Avenue, New York, N. Y.

The program of the evening consisted of an illustrated lecture by Dr. G. R. Wieland of Yale, entitled "The early Mesozoic flowering plants," which was illustrated by lantern slides and specimens. Dr. Wieland confined himself chiefly to the evidence of floral structures in the older Mesozoic, accumulated since the cycadeoid flower buds were first discovered by him in 1899. He recited some of the history of discovery in the petrified cycadeoid series, and then gave his reasons for calling the group and its allies the hemi-cycadales, or half-cycads;—that is, because of the vegetative likeness to the existing cycads, and the floral antithesis in which flowers of the one group are contrasted with cones of the other.

The petrified cycadeoids were sketched from slides showing stem, leaf and flower. Attention was called to the fact that there is a great stem-bearing stratum lying at the top of a mesa in the southern Black Hills "Rim" near Minnekahta, now set aside as the "Cycad National Monument." Here is perhaps the world's greatest deposit of semi-gem stone; for the polished surfaces and thin sections are of a uniform and uncommon beauty.

A view was given of a wedge cut from the historic Dresden cycad, found in 1753 and now about to be sectioned for the first time. The very considerable floral variation within the cycadeoids was illustrated. The most typical flowers are not those of the petrified stems, but those borne on related types with small, much branched stems. Such are the *Williamsoniella* and *Wielandiella*. The smaller flowered cycadeoids, along with their relatives formed in all lower Mesozoic time a dominant group including thousands of species. One of the most striking assemblages of this vegetation is that collected by Dr. Wieland in the Liassic of Southern Mexico.

The question whether the cycadeoids had early relatives leading toward the angiosperms, or of a possible angiospermous relationship through reduction of floral parts, was mentioned tentatively. It was not considered quite certain that the larger cycadeoid, and likewise some magnolia flowers, may not show a certain amount of secondary gigantism.

The recently discovered angiosperm group Caytoniales of the mid-Jurassic of the Yorkshire Coast, which at last definitely extends the record below Cretaceous time, was considered in detail, and it was shown that the group occurs earlier in the Mexican Lias. It was pointed out why fossil flowers are so rarely found or recognized, and it was concluded that the angiosperms did not likely arise later than the Permian.—Dr. Wieland believes that two of the most promising regions in which to explore for evidence bearing on early, or intermediate angiospermous types, are the many Rhätic outcrops in Argentina and Lias of Mexico. He has collected in both.

Arthur H. Graves,
Secretary

Meeting of May 27, 1925.

This was a joint meeting of the Wild Flower Preservation Society of America and the Torrey Botanical Club—the regular annual affair in the interests of the conservation of our native plants, held at the Museum Building of the New York Botanical Garden. Mr. Gaylord Johnson, 292 Lincoln Place, Brooklyn, was unanimously elected to membership in the Torrey Botanical Club.

Dr. Benedict, representing the committee appointed last year to secure legislation for the protection of our native plants, reported that Mr. Louis Marshall of New York City drew up two laws which were proposed in February of this year, but did not pass, the chief objection being that they were too drastic. The first was an amendment to the penal code which made more stringent and specific the penalty for removing wild plants from private lands. The second amended the State Conservation law in two ways: first by authorizing the State Commissioner of Conservation to control the picking of plants in State parks, and the second, by modifying the private park section, encouraged the

establishment of sanctuaries for the propagation and protection of wild plants. An entering wedge has, however, been finally formed in the measure for the protection of trailing arbutus on public lands, which became a law, April 1, 1925.

Mrs. Britton brought up the subject of the acquisition and preservation of the Cook Forest area in Pennsylvania, one of the largest remaining areas of primeval white pine. This movement is being furthered by the Ecological Society of America through its committees on preservation of natural conditions. On the motion of Dr. R. A. Harper it was the sense of the meeting that the societies represented endorse this movement and that Mrs. Britton, the Secretary of the Wild Flower Preservation Society of America, be empowered to draft a resolution to this effect.

Dr. N. L. Britton spoke of the publication of the Naturalists' Guide, which should be a great stimulus to the preservation of natural areas.

Mr. Norman Taylor, in speaking of the new movement for additional State Park lands, stated that it was on his recommendation that part of Montauk and also an area in Hempstead Plains between Hicksville and Syosset were included in the plans for state parks on Long Island. The general park program for Long Island has aroused opposition from two main sources:

1. From the interested and usually wealthy owners of adjacent property.

2. From those who feel that the acquisition of this land may result in the destruction of vegetation rather than in its conservation.

After some discussion for and against, the motion was passed without dissenting vote, that it was the sense of the meeting that, in so far as the establishment of these parks makes for the preservation of individual plants or vegetation, the movement has the unqualified approval and willingness to cooperate of the Wild Flower Preservation Society of America and the Torrey Botanical Club. The secretaries of the two societies were authorized to send a resolution to Mr. Moses of the Park Commissioners, to the effect that they are in sympathy with his park program and wish to do anything they can to support it.

Arthur M. Graves,
Secretary

Meeting of October 13, 1925

The meeting was held at Barnard College. The following new members were elected:

Miss Fanny A. Cook, Crystal Springs, Mississippi.

Prof. John M. Coulter, Boyce Thompson Institute, Yonkers, New York.

Mrs. J. V. Johnson, 41 Sterling Place, Brooklyn, N. Y.

Dr. L. O. Kunkel, Boyce Thompson Institute, Yonkers, N. Y.

Dr. W. J. V. Osterhout, Rockefeller Institute, 67th Street and Avenue A, New York, N. Y.

Mrs. Charlotte B. Stimpson, 1120 Fifth Avenue, New York, N. Y.

Mr. Clark Williams, 160 Broadway, New York, N. Y.

The program of the evening consisted in the relation by the various members of their experiences and collections during the summer. Dr. R. A. Harper spoke of his trip to the University of Wisconsin and remarked upon the notable advances there in the way of making museum material attractive, especially that used for class demonstrations. Particularly was this so with regard to the plant disease material in which the natural colors were preserved with remarkable accuracy. Dr. Hazen told of his visit to London where he spent several days in bibliographical work and attended a meeting of the Linnaean Society. From there he went to Norway to study the Red Snow. He exhibited a specimen which was apparently *Chlamydomonas lateritia* Lagerheim on a birch twig making a bright red coloration. The alga was only in the resting stage so that it was impossible to identify it with certainty as Chlamydomonas. He also spoke of the interesting arctic and alpine flora; in the more northern regions the alpine flora occurring at low elevations. He attended the Fourth International Plant Geography Excursion. Mr. Beale showed specimens of sphagnums, hepatics, and mosses recently collected in a marl pit near Farmingdale, New Jersey. The hepatics grew very vigorously on this limy soil. During this summer he found in the Swartzwood Lake region several patches of Leucobryum in fruit, and with Mrs. Beals collected many slime molds. Dr. Rydberg described his trip in a motor car through the Southern Appalachians. Among the regions visited were Panther and Snowy Mts. in West Virginia, and Grand-

father's Peak, Mt. Mitchell, Craggy Mts., Pisgah and Balt Mts. Many collections were made. An Aconitum, reported to him as Larkspur, was found which was poisoning cattle. Mrs. G. P. Anderson reported on her work on lichens—a full account of which will be published later in Torreya. The secretary mentioned the collection of *Linnaea borealis* on the top of Black Head in the Catskills, and also *Ribes lacustre* near the top of the same mountain. These collections were made on one of the trips of the Torrey Club during the summer.

Arthur H. Graves,
Secretary

NEWS NOTES

Dr. H. A. Gleason of the New York Botanic Gardens left on Jan. 14 for Porto Rico. He is to work in cooperation with Dr. Melville T. Cook in studying the plants of Porto Rico and their distribution. Later in the season Dr. and Mrs. N. L. Britton will join Dr. Gleason in the work.

A recent notice in the newspapers tells us that the State of Washington has joined the movement toward protecting wild flowers and has made it a misdemeanor to cut any shrubs or wild flowers within 300 feet of the public highway without permission of the owner of the land.

This fall the newspapers of New York City were full of accounts of large fields of hemp, *Cannabis sativa*, grown in or about the city for the sake of furnishing the narcotic drug hasheesh. They claimed that the hemp had been planted by a group of Mexicans, some of it in City Parks, and that they gathered the leaves at night and prepared and peddled the drug. According to the accounts, the authorities found several of these fields and destroyed a large number of the plants. (The drug is prepared from the flowering tops, chiefly of the staminate plants, not from the leaves.)

At the meeting of the American Association for the Advancement of Science held during Christmas week at Kansas City, Dr. Liberty Hyde Baily was elected president of the Association and also of the Botanical Society of America.

ERRATA

Page 52, footnote, 1924 should be 1925.
" 58, numbers 6 and 7 should be interchanged.
" 108, line 3, Vance Thompson should be Boyce Thompson.

DATES OF PUBLICATION OF TORREYA

No. 1.	Jan.–Feb.	Pages	1–24	Issued	Feb. 25, 1925
No. 2.	Mar.–Apr.	"	25–44	"	April 22, 1925
No. 3.	May-June	"	45–68	"	July 2
No. 4.	July–Aug.	"	69–88	"	Aug. 19
No. 5.	Sept.–Oct.	"	89–108	"	Oct. 27
No. 6.	Nov.–Dec.	"	109–1—	"	Jan. —, 1926

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(The names of species and varieties described as new are in **bold faced type.**)

The Torrey Botanical Club

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